

Service
Service
Service

220CW9FB/00

220CW9FB/69

220CW9FB/75

220CW9FB/93



WEIXIUZHIJIA

维修之家



Service Manual

Horizontal frequencies
30 - 83 kHz

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SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOL TAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

Important Safety Notice

Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

** Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips. **

WARNING

Critical components having special safety characteristics are identified with a by the Ref. No. in the parts list and enclosed within a broken line

(where several critical components are grouped in one area) along with the safety symbol on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design.

Service assumes all liability.

FOR PRODUCTS CONTAINING LASER :

- DANGER - Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.
- CAUTION - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- CAUTION - The use of optical instruments with this product will increase eye hazard.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

Take care during handling the LCD module with backlight unit

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- Avoid contact with water as it may as short circuit within the module.
- If the surface of panel become dirty, please wipe it off with a soft material. (Cleaning with a dirty or rough cloth may damage the panel.)

Technical Data

SEC panel

Type NR.	: SEC LTM220M1-L01
Resolution	: 1680 x 1050 (WSXGA+)
Outside dimensions	: 493.7(H) x 320.1(V) Typ. x 17.0(D) Max.
Pitch (mm)	: 0.282mm x 0.282mm
Color pixel arrangement	: RGB vertical stripe
Display surface	: Haze 25% Hard coating (3H)
Color depth	: 16.7M (6 bit Hi-FRC)
Backlight	: 4 CCFL
Active area (W x H)	: 473.76(H) x 296.1(V) mm
View angle (CR=10)	: =160 for Right/Left (Typ)
	: =160 for Up/Down (Typ)
Contrast ratio	: 1000:1 (Typ)
White luminance	: 300(Typ.)
Color gamut	: >=72%
Gate IC	: TOSHIBA
Source IC	: NEC
Response time	: Tr + Tf <=5 ms (Typ)
Vertical frequency range	: 53~76Hz

Scanning frequencies

Hor.	: 30 – 83 K Hz
Ver.	: 56 - 76 Hz
Video dot rate	: < 210 MHz for VGA and < 170 MHz for DVI,
warning message must be displayed while over 165 MHz (supplier to provide accurate scaler bandwidth number)	
Power input	: 90-264 V AC, 50/60 ± 2 Hz
Power consumption	: <50W maximum, <45W (typ.)
	< TBDWatt (with audio)

Functions:

- (1) D-SUB analog R/G/B separate inputs, H/V sync separated, Composite (H+V) TTL level, SOG sync
- (2) DVI digital Panel Link TMDS inputs, HDCP supported.

Ambient temperature: 0 °C - 40 °C

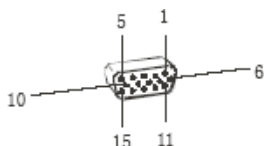
Power input connection

Power cord length	: 1.8 M
Power cord type	: 3 leads power cord with protective earth plug.

Power management

The monitor must comply with the Microsoft On Now specification, and meet EPA requirements.

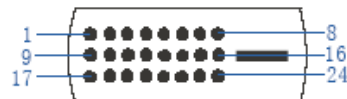
Mode	HSYNC	VSING	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	< 36 W TBD W max.	Blue LED	--
Off	Off	Off	blanked	< 0.8 W	Blinking Blue LED Period: 3sec On, 3sec Off	< 3 s
DC Power Off			N/A	< 0.8 W	LED Off	



PIN No.	SIGNAL	PIN No.	SIGNAL
1	Red	9	DDC +3.3V or +5V
2	Green/ SOG	10	Logic GND
3	Blue	11	Sense (GND)
4	Sense (GND)	12	Bi-directional data
5	Cable Detect (GND)	13	H/H+V sync

6	Red GND	14	V-sync
7	Green GND	15	Data clock
8	Blue GND		

Input DVI-D connector pin



Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V)
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S. clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

Susceptibility of display to external environment

Operating

- Temperature : 0 to 35 degree C
- Humidity : 80% max
- Altitude : 0-3658m
- Air pressure : 600-1100 mBAR

Storage

- Temperature : -20 to 60 degree C
- Humidity : 95% max
- Altitude : 0-12192m
- Air pressure : 300-1100 mBAR

Note: recommend at 5 to 35°C, Humidity less than 60 %

Technical Data

LPL panel

Type NR.	: LPL LM220WE1-TLE2/4
Resolution	: 1680 x 1050 (WSXGA+)
Outside dimensions	: 493.7(H) x 320.1 (V) x 16.5(D) mm (Typ.)
Pitch (mm)	: 0.282mm x 0.282mm
Color pixel arrangement	: 1680 horizontal By 1050 vertical Pixels. RGB stripe arrangement
Display surface	: Hard coating (3H), Anti-glare treatment of the front polarizer
Color depth	: 16.7M colors
Backlight	: 4 CCFL
Active area (W x H)	: 21.995 inches(558.673mm) diagonal (Aspect ratio 16:10)
View angle (CR>=10)	: R/L 170(Typ.), U/D 160(Typ.)
Contrast ratio	: >1000:1 (Typ)
White luminance	: 300 cd/m2(Typ. Center 1 point)
Color gamut	: >=72%
Gate IC	: N/A
Source IC	: Magna , OKI
Response time	: <=5 ms (Typ)
Vertical frequency range	: 50~75Hz

Scanning frequencies

Hor.	: 30 – 83 K Hz
Ver.	: 56 - 76 Hz
Video dot rate	: < 210 MHz for VGA and < 170 MHz for DVI, warning message must be displayed while over 165 MHz (supplier to provide accurate scaler bandwidth number)
Power input	: 90-264 V AC, 50/60 ± 2 Hz
Power consumption	: <50W maximum, <45W (typ.) < TBDWatt (with audio)

Functions:

- (1) D-SUB analog R/G/B separate inputs, H/V sync separated, Composite (H+V) TTL level, SOG sync
(2) DVI digital Panel Link TMDS inputs, HDCP supported.

Ambient temperature: 0 °C - 40 °C

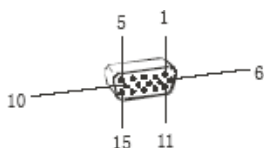
Power input connection

Power cord length	: 1.8 M
Power cord type	: 3 leads power cord with protective earth plug

Power management (supplier to input)

The monitor must comply with the Microsoft On Now specification, and meet EPA requirements.

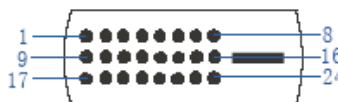
Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	< 36 W TBD W max.	Blue LED	--
Off	Off	Off	blanked	< 0.8 W	Blinking Blue LED Period: 3sec On, 3sec Off	< 3 s
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7	Green GND	15	Data clock
8	Blue GND		

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Pin No.	Description
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5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V)
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

Susceptibility of display to external environment

Operating

- Temperature : 0 to 35 degree C
- Humidity : 80% max
- Altitude : 0-3658m
- Air pressure : 600-1100 mBAR

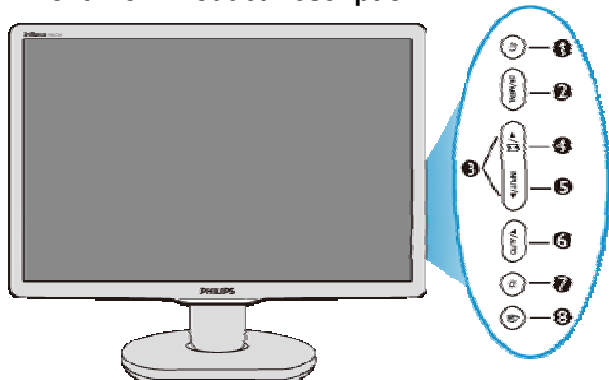
Storage

- Temperature : -20 to 60 degree C
- Humidity : 95% max
- Altitude : 0-12192m
- Air pressure : 300-1100 mBAR

Note: recommend at 5 to 35°C, Humidity less than 60 %

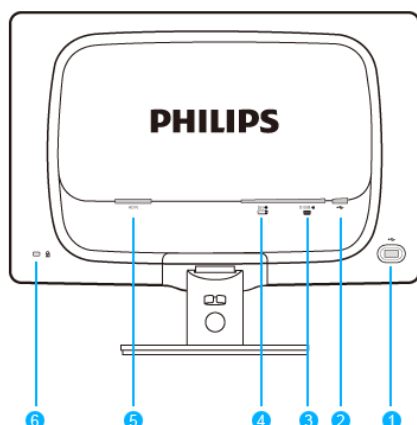
Installation

Front View Product Description



- 1  To switch monitor's power On and Off
- 2 MENU / OK To access the OSD menu
- 3  To adjust the OSD menu
- 4  Change to 4:3 display
- 5 Input To change the signal input source.
- 6 AUTO /  Automatically adjust the horizontal position, vertical position, phase and clock settings / Return to previous OSD level.
- 7  To adjust brightness of the display
- 8  SmartImage. There are five modes to be selected: Office Work, Image Viewing, Entertainment, Economy, and Off

Rear View



- 1 USB downstream port
- 2 USB upstream port
- 3 VGA input
- 4 DVI-D input (available for selective models)
- 5 AC power input
- 6 Kensington anti-theft lock

Accessory Pack

Unpack all the parts.



Power cord

DVI cable (Optional)

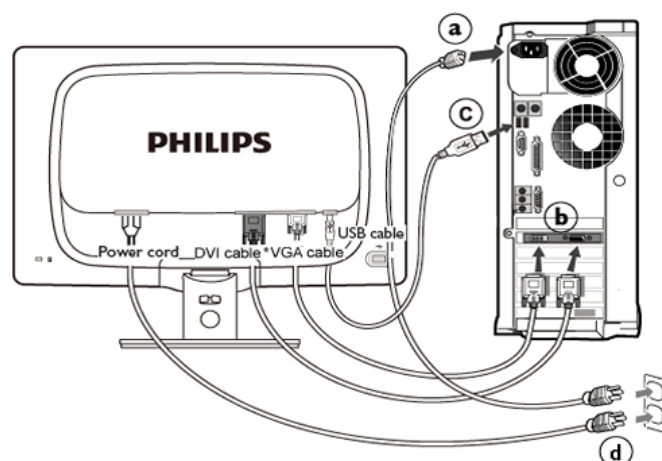
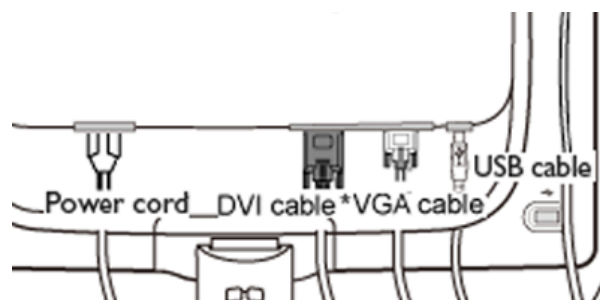


VGA cable

EDFU pack

Connecting to Your PC

1) Connect the power cord to the back of the monitor firmly. (Philips has pre-connected VGA cable for the first installation.



2) Connect to PC

- (a) Turn off your computer and unplug its power cable.
- (b) Connect the monitor signal cable to the video connector on the back of your computer.
- (c) Connect the USB cable to the USB port of your computer.
- (d) Plug the power cord of your computer and your monitor into a nearby outlet.
- (e) Turn on your computer and monitor. If the monitor displays an image, installation is complete.

Trouble shooting

This page deals with problems that can be corrected by a user. If the problem still persists after you have tried these solutions, contact Philips customer service representative.

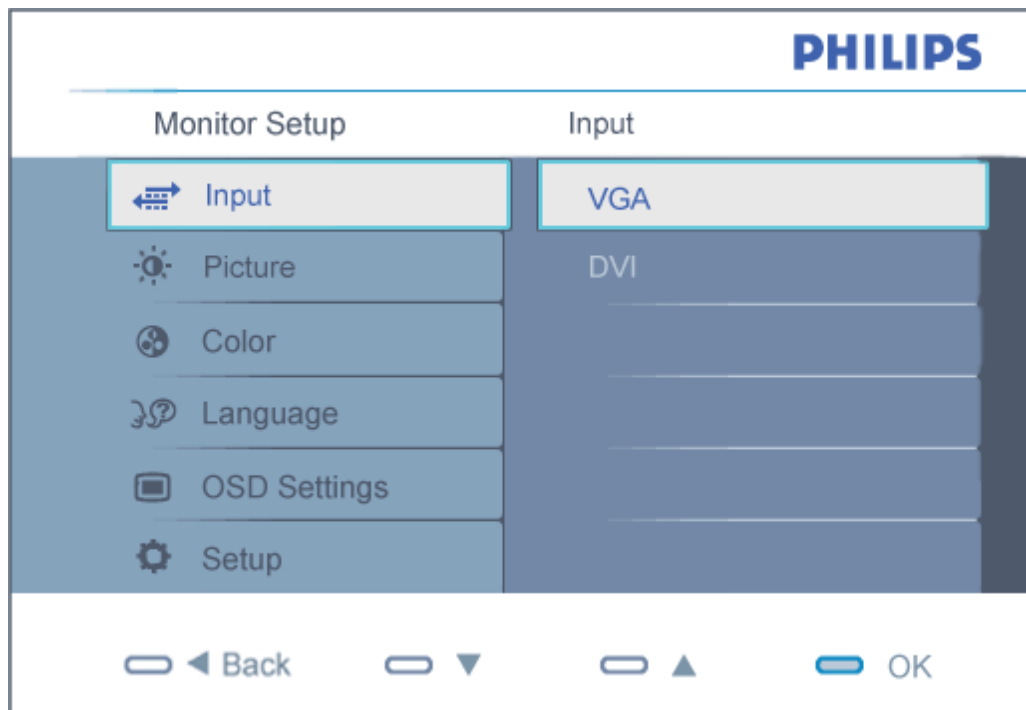
Common Problems	
Having this problem	Check these items
No Picture (Power LED not lit)	1. Make sure the power cord is plugged into the power outlet and into the back of the monitor. 2. First, ensure that the power button on the front of the monitor is in the OFF position, then press it to the ON position.
No Picture (Power LED is amber or yellow)	1. Make sure the computer is turned on. 2. Make sure the signal cable is properly connected to your computer. 3. Check to see if the monitor cable has bent pins. 4. The Energy Saving feature may be activated
Screen says 	1. Make sure the monitor cable is properly connected to your computer. (Also refer to the Quick Set-Up Guide). 2. Check to see if the monitor cable has bent pins. 3. Make sure the computer is turned on.
AUTO button not working properly	1. The Auto Function is designed for use on standard Macintosh or IBM-compatible PCs running Microsoft Windows. 2. It may not work properly if using nonstandard PC or video card.
Imaging Problems	
Display position is incorrect	1. Press the Auto button. 2. Adjust the image position using the Horizontal Position and/or Vertical Position in OSD Main Controls.
Image vibrates on the screen	Check that the signal cable is properly connected to the graphics board or PC.
Vertical flicker appears 	1. Press the Auto button. 2. Eliminate the vertical bars using the More Settings of Phase/Clock in OSD Main Controls.
Horizontal flicker appears 	1. Press the Auto button. 2. Eliminate the vertical bars using the More Settings of Phase/Clock in OSD Main Controls.
The screen is too bright or too dark	Adjust the contrast and brightness on OSD Main Controls. (The backlight of the LCD monitor has a fixed life span. When the screen becomes dark or begins to flicker, please contact your dealer).
An after-image appears	If an image remains on the screen for an extended period of time, it may be imprinted in the screen and leave an afterimage. This usually disappears after a few hours.
An after-image remains after the power has been turned off.	This is characteristic of liquid crystal and is not caused by a malfunction or deterioration of the liquid crystal. The after-image will disappear after a period of time.
Green, red, blue, dark, and white dots Remains	The remaining dots are normal characteristic of the liquid crystal used in today's technology.

On Screen Display

Description of the On Screen Display

What is the On-Screen Display?

On-Screen Display (OSD) is a feature in all Philips LCD monitors. It allows an end user to adjust screen performance or select functions of the monitors directly through an on-screen instruction window. A user friendly on screen display interface is shown as below :



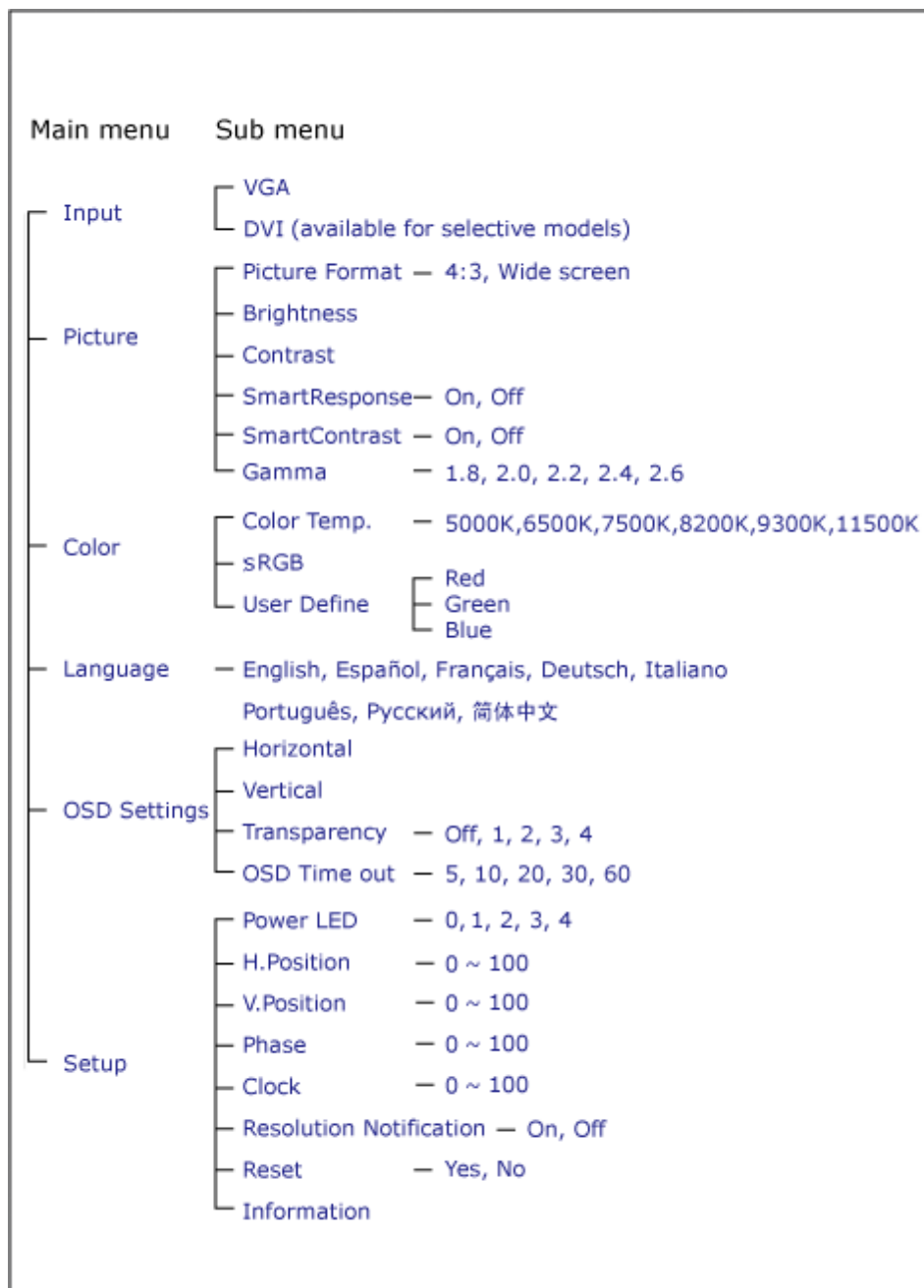
Basic and simple instruction on the control keys.

In the OSD shown above users can press ▼▲ buttons at the front bezel of the monitor to move the cursor, **OK** to confirm the choice or change.

On Screen Display

The OSD Tree

Below is an overall view of the structure of the On-Screen Display. You can use this as a reference when you want to work your way around the different adjustments later on.



Resolution notification

This monitor is designed for optimal performance at its native resolution, 1680X1050@60Hz. When the monitor is powered on at a different resolution, an alert is displayed on screen: Use 1680x1050@60Hz for best results.

Display of the native resolution alert can be switched off from Setup in the OSD (On Screen Display) menu.

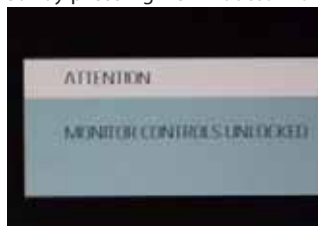
To Lock/Unlock OSD FUNCTION(User Mode)

The OSD function can be locked by pressing "OK" button (1) for more than 10 seconds, the screen shows following windows for 4 seconds. Every time when you press "OK" button, this message appears on the screen automatically.



Unlock OSD function

Unlocked OSD function can be released by pressing "OK" button for more than 10 seconds again.



Access Factory Mode

- 1). Turn off monitor.
- 2). [Push "AUTO" & "MENU" buttons at the same time and hold them] + [Press "power" button until comes out "Windows screen"] => then release all buttons
- 3). Press "MENU" button, wait until the OSD menu with Characters "HUDSON 220SW8 V0.07 2007-12-21" (below OSD menu) come on the Screen of the monitor.



↑
Factory Mode indicator

Factory Menu

Cursor can move on gray color area

Hot key function: by pressing " UP " and " DOWN " key

Simultaneously at User Mode (or Factory Mode)

(PS: The Offset R G B function can be used on reduce or eliminate snowy noise on the background when the resolution of video signal is 1680*1050 vertical 60Hz. Slightly increase or decrease the value until snowy noise completely disappear .

Access Aging Mode

Step 1 : Access Factory Mode then enter Factory Menu.

Step 2 : By pressing " UP " and " DOWN " key to Burning Icon. Press "MENU" then press " UP " and " DOWN " key to turn on Aging Mode.



Step 3 : Disconnect interface cable between Monitor and PC.

After 3 seconds,
bring up:



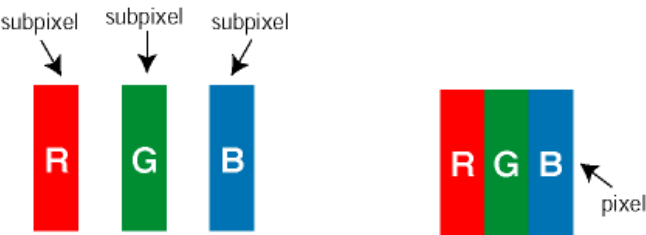
repeatedly

Connect Signal cable again => go back to normal display

Philips Pixel Defect Policy

Philips' Flat Panel Monitors Pixel Defect Policy

Philips strives to deliver the highest quality products. We use some of the industry's most advanced manufacturing processes and practice stringent quality control. However, pixel or sub pixel defects on the TFT LCD panels used in flat panel monitors are sometimes unavoidable. No manufacturer can guarantee that all panels will be free from pixel defects, but Philips guarantees that any monitor with an unacceptable number of defects will be repaired or replaced under warranty. This notice explains the different types of pixel defects and defines acceptable defect levels for each type. In order to qualify for repair or replacement under warranty, the number of pixel defects on a TFT LCD panel must exceed these acceptable levels. For example, no more than 0.0004% of the sub pixels on a 19" XGA monitor may be defective. Furthermore, Philips sets even higher quality standards for certain types or combinations of pixel defects that are more noticeable than others. This policy is valid worldwide.



Pixels and Sub pixels

A pixel, or picture element, is composed of three sub pixels in the primary colors of red, green and blue. Many pixels together form an image. When all sub pixels of a pixel are lit, the three colored sub pixels together appear as a single white pixel. When all are dark, the three colored sub pixels together appear as a single black pixel. Other combinations of lit and dark sub pixels appear as single pixels of other colors.

Types of Pixel Defects

Pixel and sub pixel defects appear on the screen in different ways. There are two categories of pixel defects and several types of sub pixel defects within each category.

Bright Dot Defects Bright dot defects appear as pixels or sub pixels that are always lit or 'on'. That is, a *bright dot* is a sub-pixel that stands out on the screen when the monitor displays a dark pattern. There are the types of bright dot defects:



Two adjacent lit sub pixels:

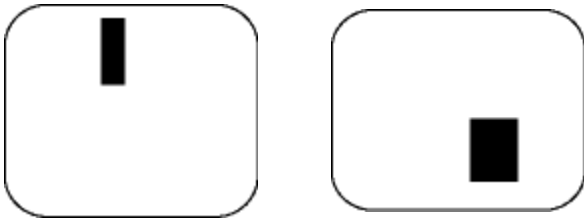
- Red + Blue = Purple
- Red + Green = Yellow
- Green + Blue = Cyan (Light Blue)

Three adjacent lit sub pixels (one white pixel)



A red or blue *bright dot* must be more than 50 percent brighter than neighboring dots while a green bright dot is 30 percent brighter than neighboring dots.

Black Dot Defects Black dot defects appear as pixels or sub pixels that are always dark or 'off'. That is, a *dark dot* is a sub-pixel that stands out on the screen when the monitor displays a light pattern. These are the types of black dot defects:



One dark sub pixel

Two or three adjacent dark sub pixels

Proximity of Pixel Defects

Because pixel and sub pixels defects of the same type that are near to one another may be more noticeable, Philips also specifies tolerances for the proximity of pixel defects.

Pixel Defect Tolerances

In order to qualify for repair or replacement due to pixel defects during the warranty period, a TFT LCD panel in a Philips flat panel monitor must have pixel or sub pixel defects exceeding the tolerances listed in the following tables.

BRIGHT DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	220CW9
1 lit subpixel	3
2 adjacent lit subpixels	1
3 adjacent lit subpixels (one white pixel)	0
Distance between two bright dot defects*	>15mm
Total bright dot defects of all types	3

BLACK DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	220CW9
1 dark subpixel	5
2 adjacent dark subpixels	2
3 adjacent dark subpixels	0
Distance between two black dot defects*	>15mm
Total black dot defects of all types	5

TOTAL DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	220CW9
Total bright or black dot defects of all types	5

Note:

* 1 or 2 adjacent sub pixel defects = 1 dot defect

Mechanical Instructions

Disassemble the base, press the circular button

Bring the hinge



Disassemble the clip, use a small screw-driver prize up



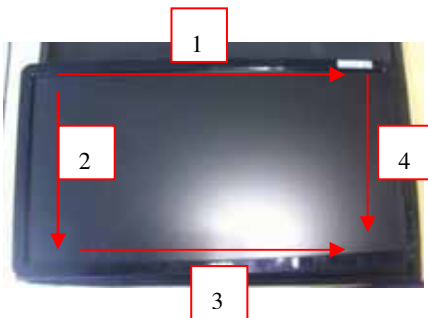
Disassemble the stand, → 6 screws



disassembly the bezel from the monitor, notice the disassembly order :

- 1.Top (1) parts of bezel
- 2.Left (2) parts of bezel
- 3.Bottom (3) parts of bezel
4. Right (4) parts of bezel

Don't draw the BZL



Turn over the monitor ,Uplift the Rear cover from the monitor



Tear off the acetic tape



Draw the ffc cable. Take off the rear cover



Tear off these three acetic tapes

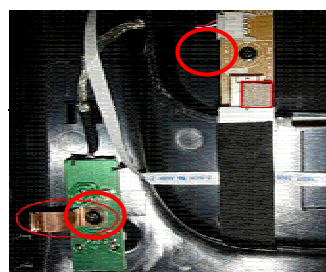
Take the entire internal mechanism from Bezel and then put it on the cushion. Draw the ffc cable



Disassembled the rear cover :

C/B screw *2 ,USB screw*1,The other USB screw*1

Then tear off two gaskets on the top of two USB PCBAS.



Mechanical Instructions

Disassembled the Main-BKT : hexagonal screw *4



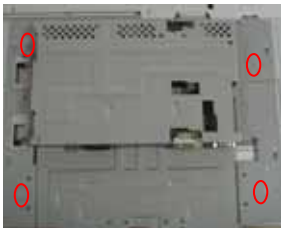
Tear off these two AL tapes



Tear off this Mylar AL tape on the top of lamp cable,
Pull out disassemble the lamp cables



Disassemble the Main-BKT, → 4 screws



Uplift the Main-BKT

unlock the LVDS by using two hands(see note).



Disassemble the Power board→ 4 screws

Tear off the cover of AC-SOCKET



Disassemble the ITF-board→ 2 screws



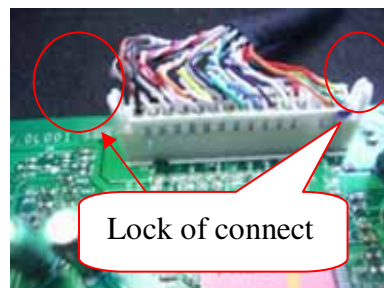
Take the PCBA from Main-BKT and then put it on the cushion



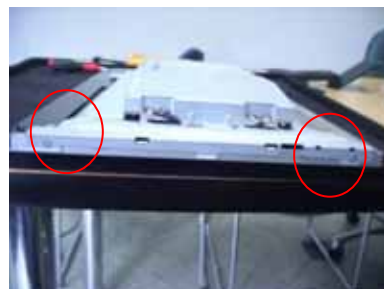
Pull out the cable of Power board



Pull out the LVDS cable



Disassembled the Main-BKT : Side screw*4



Alignment procedure

1. Turn on the LCD monitor .
2. Turn on the Timing/pattern generator. See Fig.1
3. Preset LCD color Analyzer CA-1 10
- Remove the lens protective cover of probe CA-A30.
- Set measuring/viewing selector to measuring position for reset analyzer.(zero calibration) as Fig.2
- Turn on the color analyzer (CA-1 10)
- Press 0-CAL button to starting reset analyzer .

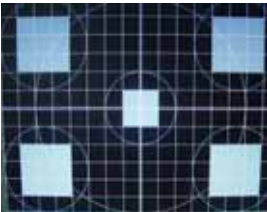


Fig. 1

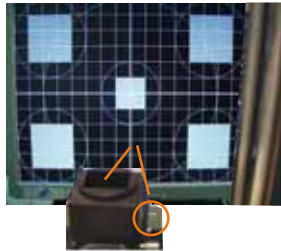


Fig. 2

4. Access Factory Mode

- 1). Turn off monitor.
- 2). [Push "AUT O" & "MENU" buttons at the same time and hold them] +[Press "power" button until comes out "Windows screen"] => then release all buttons
- 3). Press "MENU" button, wait until the OSD menu with Characters" HUDSON 240BW8 V0.13 2007-08-10 "(below OSD menu) come on the Screen of the monitor. as shown in Fig3.



↑
Factory Mode indicator

Fig. 3

- 4). Press "MENU" button, then select factory mode indicator by "LEFT" or "RIGHT" button .Press "MENU" button to bring up submenu windows as below:



Fig. 4

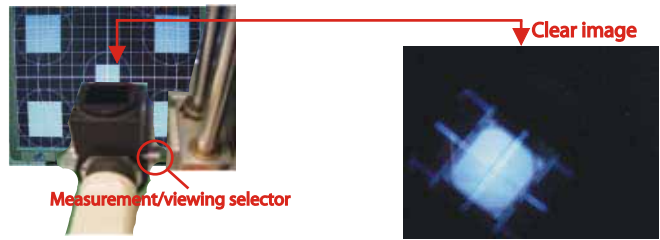


Fig.5

5.Display

Press "UP" or "DOWN" button to select . Change the value by "UP" or "DOWN" key until the X, Y co-ordinates as below

5.1 White color adjustment

There are three factory preset white color 9300K , 6500K , sRGB.

Apply full white pattern, with brightness in 100 % position and the contrast control at 50 % position.

The 1931 CIE Chromaticity (color triangle) diagram (x,y) coordinate for the screen centers should be:

Production		Product SPEC	
5000K	x = 0.345 ± 0.006 y = 0.357 ± 0.006	5000K	x = 0.345 ± 0.02 y = 0.357 ± 0.02
6500K	x = 0.313 ± 0.006 y = 0.329 ± 0.006	6500K	x = 0.313 ± 0.02 y = 0.329 ± 0.02
7500K	x = 0.298 ± 0.006 y = 0.314 ± 0.006	7500K	x = 0.298 ± 0.02 y = 0.314 ± 0.02
8200K	x = 0.291 ± 0.006 y = 0.306 ± 0.006	8200K	x = 0.291 ± 0.02 y = 0.306 ± 0.02
9300K	x = 0.283 ± 0.006 y = 0.297 ± 0.006	9300K	x = 0.283 ± 0.02 y = 0.297 ± 0.02
11500K	x = 0.270 ± 0.006 y = 0.281 ± 0.006	11500K	x = 0.270 ± 0.02 y = 0.281 ± 0.02

Quality inspect

5000K	x = 0.345 ± 0.015 y = 0.357 ± 0.015
6500K	x = 0.313 ± 0.015 y = 0.329 ± 0.015
7500K	x = 0.298 ± 0.015 y = 0.314 ± 0.015
8200K	x = 0.291 ± 0.015 y = 0.306 ± 0.015
9300K	x = 0.283 ± 0.015 y = 0.297 ± 0.015
11500K	x = 0.270 ± 0.015 y = 0.281 ± 0.015

FAQs (Frequently Asked Questions)

General FAQs

Q: When I install my monitor what should I do if the screen shows 'Cannot display this video mode'?

A: Recommended video mode for Philips 22": 1680x1050 @ 60Hz.
 1. Unplug all cables, then connect your PC to the monitor that you used previously.
 2. In the Windows Start Menu, select Settings/Control Panel. In the Control Panel Window, select the Display icon. Inside the Display Control Panel, select the 'Settings' tab. Under the setting tab, in box labeled 'desktop area', move the slider bar to 1680x1050 pixels (22").
 3. Open 'Advanced Properties' and set the Refresh Rate to 60Hz, then click OK.
 4. Restart your computer and repeat step 2 and 3 to verify that your PC is set at 1680x1050@ 60Hz (22").
 5. Shut down your computer, disconnect your old monitor and reconnect your Philips LCD monitor.
 6. Turn on your monitor and then turn on your PC.

Q: What are the .inf and .icm files on the CD-ROM? How do I install the drivers (.inf and .icm)?

A: These are the driver files for your monitor. Follow the instructions in your user manual to install the drivers. Your computer may ask you for monitor drivers (.inf and .icm files) or a driver disk when you first install your monitor. Follow the instructions to insert the (companion CD-ROM) included in this package. Monitor drivers (.inf and .icm files) will be installed automatically.

Q: How do I adjust the resolution?

A: Your video card/graphic driver and monitor together determine the available resolutions. You can select the desired resolution under Windows® Control Panel with the "Display properties".

Q: What if I get lost when I am making monitor adjustments?

A: Simply press the Menu button, the Setup button, then select 'Reset' to recall all of the original factory settings.

Q: What is the Auto function?

A: The AUTO adjustment key restores the optimal screen position, phase and clock settings by pressing of a single button – without the need to navigate through OSD (On Screen Display) menus and control keys.

Note: Auto function is available in selected models only.

Q: My Monitor has no power (Power LED does not light up). What should I do?

A: Make sure the AC power cord is connected between the monitor and AC outlet, and click a key on keyboard/mouse to wake up the PC.

Q: Will the LCD monitor accept an interlaced signal under PC models?

A: No. If an Interlace signal is used, the screen displays both odd and even horizontal scanning lines at the same time, thus distorting the picture.

Q: What does the Refresh Rate mean for LCD?

A: Unlike CRT display technology, in which the speed of the electron beam is swept from the top to the bottom of the screen determines flicker, an active matrix display uses an active element (TFT) to control each individual pixel and the refresh rate is therefore not really applicable to LCD technology.

Q: Will the LCD screen be resistant to scratches?

A: A protective coating is applied to the surface of the LCD, which is durable to a certain extent (approximately up to the hardness of a 2H pencil). In general, it is recommended that the panel surface is not subject to any excessive shocks or scratches.

Q: How should I clean the LCD surface?

A: For normal cleaning, use a clean, soft cloth. For extensive cleaning,

please use isopropyl alcohol. Do not use other solvents such as ethyl alcohol, ethanol, acetone, hexane, etc.

Q: Can I change the color setting of my monitor?

A: Yes, you can change your color setting through OSD control as the following procedures,

1. Press "Menu" to show the OSD (On Screen Display) menu
2. Press "Down Arrow" to select the option "Color" then press "OK" to enter color setting, there are three settings as below.
 - a. Color Temperature; The six settings are 5000K, 6500K, 7500K, 8200K, 9300K and 11500K. With settings in the 5000K range the panel appears 'warm,' with a red-white color tone, while a 11500K temperature yields 'cool, blue-white toning.'
 - b. sRGB; this is a standard setting for ensuring correct exchange of colors between different device (e.g. digital cameras, monitors, printers, scanners, etc)
 - c. User Define; the user can choose his/her preference color setting by adjusting red, green blue color.
 - d. Gamma; The five settings are 1.8, 2.0, 2.2, 2.4, and 2.6.

*A measurement of the color of light radiated by an object while it is being heated. This measurement is expressed in terms of absolute scale, (degrees Kelvin). Lower Kelvin temperatures such as 2004K are red; higher temperatures such as 9300K are blue. Neutral temperature is white, at 6504K.

Screen Adjustments

Q: When I install my monitor, how do I get the best performance from the monitor?

A: For best performance, make sure your display settings are set at 1680x1050@ 60Hz for 22".

Q: How do LCDs compare to CRTs in terms of radiation?

A: Because LCDs do not use an electron gun, they do not generate the same amount of radiation at the screen surface.

Compatibility with other Peripherals

Q: Can I connect my LCD monitor to any PC, workstation or Mac?

A: Yes. All Philips LCD monitors are fully compatible with standard PCs, Macs and workstations. You may need a cable adapter to connect the monitor to your Mac system. Please contact your Philips sales representative for more information.

Q: Are Philips LCD monitors Plug-and-Play?

A: Yes, the monitors are Plug-and-Play compatible with Windows® 95, 98, 2000, XP and Vista.

Q: What is USB (Universal Serial Bus)?

A: Think of USB as a smart plug for PC peripherals. USB automatically determines resources (like driver software and bus bandwidth) required by peripherals. USB makes necessary resources available without user intervention. There are three main benefits of USB. USB eliminates "case anxiety," the fear of removing the computer case to install circuit board cards -- that often requires adjustment of complicated IRQ settings -- for add-on peripherals. USB does away with "port gridlock." Without USB, PCs are normally limited to one printer, two COM port devices (usually a mouse and modem), one Enhanced Parallel Port add-on (scanner or video camera, for example), and a joystick. More and more peripherals for multimedia computers come on the market every day. With USB, up to 127 devices can run simultaneously on one computer. USB permits "hot plug-in." No need to shut down, plug in, reboot and run set up to install peripherals. No need to go through the reverse process to unplug a device. Bottom line: USB transforms today's "Plug-and-Play" into true Plug-and-Play!

Please refer to glossary for more information about USB.

Q: What is a USB hub?

A: A USB hub provides additional connections to the Universal Serial Bus. A hub's upstream port connects a hub to the host, usually a PC. Multiple downstream ports in a hub allows connection to another hub or device, such as a USB keyboard, camera or printer.

FAQs (Frequently Asked Questions)

LCD Panel Technology

Q: What is a Liquid Crystal Display?

A: A Liquid Crystal Display (LCD) is an optical device that is commonly used to display ASCII characters and images on digital items such as watches, calculators, portable game consoles, etc. LCD is the technology used for displays in notebooks and other small computers. Like light-emitting diode and gas-plasma technologies, LCD allows displays to be much thinner than cathode ray tube (CRT) technology. LCD consumes much less power than LED and gas-displays because it works on the principle of blocking light rather than emitting it.

Q: What differentiates passive matrix LCDs from active matrix LCDs?

A: An LCD is made with either a passive matrix or an active matrix display grid. An active matrix has a transistor located at each pixel intersection, requiring less current to control the luminance of a pixel. For this reason, the current in an active matrix display can be switched on and off more frequently, improving the screen refresh time (your mouse pointer will appear to move more smoothly across the screen, for example). The passive matrix LCD has a grid of conductors with pixels located at each intersection in the grid.

Q: What are the advantages of TFT LCD compared with CRT?

A: In a CRT monitor, a gun shoots electrons and general light by colliding polarized electrons on fluorescent glass. Therefore, CRT monitors basically operate with an analog RGB signal. A TFT LCD monitor is a device that displays an input image by operating a liquid crystal panel. The TFT has a fundamentally different structure than a CRT: Each cell has an active matrix structure and independent active elements. A TFT LCD has two glass panels and the space between them is filled with liquid crystal. When each cell is connected with electrodes and impressed with voltage, the molecular structure of the liquid crystal is altered and controls the amount of inlet lighting to display images. A TFT LCD has several advantages over a CRT, since it can be very thin and no flickering occurs because it does not use the scanning method.

Q: Why is vertical frequency of 60Hz optimal for an LCD monitor?

A: Unlike a CDT monitor, the TFT LCD panel has a fixed resolution. For example, an XGA monitor has 1024x3 (R, G, B) x 768 pixels and a higher resolution may not be available without additional software processing. The panel is designed to optimize the display for a 65MHz dot clock, one of the standards for XGA displays. Since the vertical/horizontal frequency for this dot clock is 60Hz/48kHz, the optimum frequency for this monitor is 60Hz.

Q: What kind of wide-angle technology is available? How does it work?

A: The TFT LCD panel is an element that controls/displays the inlet of a backlight using the dual-refraction of a liquid crystal. Using the property that the projection of inlet light refracts toward the major axis of the liquid element, it controls the direction of inlet light and displays it. Since the refraction ratio of inlet light on liquid crystal varies with the inlet angle of the light, the viewing angle of a TFT is much narrower than that of a CDT. Usually, the viewing angle refers to the point where the contrast ratio is 10. Many ways to widen the viewing angle are currently being developed and the most common approach is to use a wide viewing angle film, which widens the viewing angle by varying the refraction ratio. IPS (In Plane Switching) or MVA (Multi Vertical Aligned) is also used to give a wider viewing angle.

Q: Why is there no flicker on an LCD Monitor?

A: Technically speaking, LCDs do flicker, but the cause of the phenomenon is different from that of a CRT monitor -- and it has no impact of the ease of viewing. Flickering in an LCD monitor relates to usually undetectable luminance caused by the difference between positive and negative voltage. On the other hand, CRT flickering that can irritate the human eye occurs when the on/off action of the fluorescent object becomes visible. Since the reaction speed of liquid crystal in an LCD panel is much slower, this troublesome form of flickering is not present in an LCD display.

Q: Why is an LCD monitor virtually free of Electro Magnetic Interference?

A: Unlike a CRT, an LCD monitor does not have key parts that generate Electro Magnetic Interference, especially magnetic fields. Also, since an LCD display utilizes relatively low power, its power supply is extremely quiet.

Ergonomics, Ecology and Safety Standards

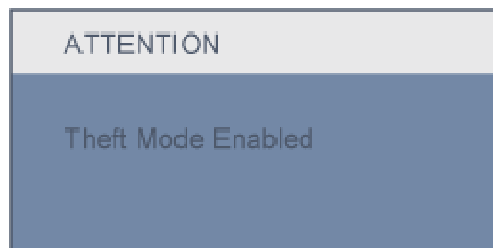
Q: What is the CE mark?

A: The CE (Conformité Européenne) mark is required to be displayed on all regulated products offered for sale on the European market. This 'CE' mark means that a product complies with the relevant European Directive. A European Directive is a European 'Law' that relates to health, safety, environment and consumer protection, much the same as the U.S. National Electrical Code and UL Standards.

Q: Does the LCD monitor conform to general safety standards?

A: Yes. Philips LCD monitors conform to the guidelines of MPR-II and TCO 99/03 standards for the control of radiation, electromagnetic waves, energy reduction, electrical safety in the work environment and recyclability. The specification page provides detailed data on safety standards.

Q: After I change new PC, I found this information on screen, how can I do?



A: Because you activate Theft Deterrence function in SmartControl II. Please contact IT manager or Philips Service Center.

Electrical Instructions

1. Electrical characteristics

1.1 Interface signals

1). D-Sub Analog

Input signal: Video, Hsync., Vsync

Video: 0.7 Vp-p, input impedance, 75 ohm @DC

Sync.: Separate sync TTL level, input impedance 2.2k ohm terminate

Hsync Positive/Negative

Vsync Positive/Negative

Composite sync TTL level, input impedance 2.2k ohm terminate (Positive/Negative)

Sync on green video 0.3 Vp-p Negative (Video 0.7 Vp-p Positive)

2). DVI-D Digital

Input signal: Single TMDS link (Three channels: RX0-/, RX1-/, RX2-/+)

3). USB PLUG

USB port (1 upstream, 1 downstream)

1.2 Interface

1.2.1 D-Sub Cable

Length : 1.8 M +/- 50 mm

Fix with monitor when packing, with transplant pin protective cover.

Connector type : D-Sub male with DDC2B pin assignments.

Blue connector thumb-operated jack screws

1.2.2 DVI Cable

The input signals are applied to the display through DVI-D cable.

Length : 1.8 M +/- 50 mm

Connector type : DVI-D male with DDC-2B pin assignments

White connector thumb-operated jackscrews

With transplant pin protective cover.

1.3 Timing requirement

1.3.1 Mode storing capacity

Factory preset modes : 13

Preset modes : 50

User modes : 10

1.3.2 Factory preset modes (18 modes)

20W and 22W Preset Mode					Factory Preset mode: 18 Sets	
Item	H.Freq	Mode	Resolution	V.Freq (Hz)	BW(MHz)	
1	31.469	640x480	640x480	75.000	75.000	
2	31.469	640x480	720x480	75.000	75.000	
3	31.469	640x480	640x480	59.94	59.94	
4	35	MACNTOSH	640x480	67		
5	37.861	VESA	640x480	72.000	72.000	
6	37.861	VESA	640x480	75		
7	43.259	VESA	640x480	85.000	85.000	
8	35.156	VESA	800x600	56.25		
9	37.861	VESA	800x600	56.25		
10	48.077	VESA	800x600	72.188		
11	48.077	VESA	800x600	75		
12	50.624	VESA	800x600	85.000	85.000	
13	49.7	MACNTOSH	832x624	75		
14	56.4	-	960x720	75		
15	44.75	-	960x720	60		
16	48.353	VESA	1024x768	60.000	60.000	
17	59.476	VESA	1024x768	75.000	75.000	
18	59.476	VESA	1024x768	75.000	75.000	
19	61.00	640x480	1024x768	75.781		
20	59.477	VESA	1024x768	84.967		
21	59.477	CVT 2.3MA	1280x720	60		
22	59.477	CVT 2.3MA	1280x720	75		
23	54.1	-	1152x864	60		
24	63.851	VESA	1152x864	70.000		
25	63.851	VESA	1152x864	75		
26	63.851	MACNTOSH	1152x864	75		
27	61.845	SUN WS	1152x864	68.000		
28	71.81	SUN WS	1152x864	75.15		
29	48.7	CVT	1280x800	59.91		
30	62.0	CVT	1280x800	74.80		
31	60	VESA	1280x800	60		
32	75	VESA	1280x800	75		
33	63.851	VESA	1280x1024	60.00		
34	71.81	SUN WS	1280x1024	67.88		
35	75	CVT	1280x1024	72		
36	75.076	VESA	1280x1024	75.000		
37	61.13	SUN WS	1280x1024	75.11		
38	91.1	VESA	1280x1024	85		
39	44.722	-	1280x720	60		
40	52.5	-	1280x720	75		
41	54	CVT	1400x1050	60	121.25	
42	59	CVT	1400x1050	75	155.00	
43	61.5	CVT	1400x1050	85	229.5	
44	59.476	VESA	1440x900	59.91	59.91	
45	55.335	VESA	1440x900	53.500	108.5	
46	70.625	VESA	1440x900	74.800	135.75	
47	75	VESA	1600x1200	60	161	
48	59.476	CVT 1.3MA	1920x1080	60	181	
49	59.476	CVT 1.3MA	1920x1080	60	181	
50	59.476	CVT 1.3MA	1920x1080	60	181	

2. White color adjustment

There are three factory preset white color 9300K, 6500K, sRGB. Apply full white pattern, with brightness in 100 % position and the contrast control at 50 % position. The 1931 CIE Chromaticity (color triangle) diagram (x,y) coordinate for the screen center should be:

Production		Product SPEC	
5000K	$x = 0.345 \pm 0.006$	5000K	$x = 0.345 \pm 0.02$
	$y = 0.357 \pm 0.006$		$y = 0.357 \pm 0.02$
6500K	$x = 0.313 \pm 0.006$	6500K	$x = 0.313 \pm 0.02$
	$y = 0.329 \pm 0.006$		$y = 0.329 \pm 0.02$
7500K	$x = 0.298 \pm 0.006$	7500K	$x = 0.298 \pm 0.02$
	$y = 0.314 \pm 0.006$		$y = 0.314 \pm 0.02$
8200K	$x = 0.291 \pm 0.006$	8200K	$x = 0.291 \pm 0.02$
	$y = 0.306 \pm 0.006$		$y = 0.306 \pm 0.02$
9300K	$x = 0.283 \pm 0.006$	9300K	$x = 0.283 \pm 0.02$
	$y = 0.297 \pm 0.006$		$y = 0.297 \pm 0.02$
11500K	$x = 0.270 \pm 0.006$	11500K	$x = 0.270 \pm 0.02$
	$y = 0.281 \pm 0.006$		$y = 0.281 \pm 0.02$

Quality inspect

5000K	$x = 0.345 \pm 0.015$
	$y = 0.357 \pm 0.015$
6500K	$x = 0.313 \pm 0.015$
	$y = 0.329 \pm 0.015$
7500K	$x = 0.298 \pm 0.015$
	$y = 0.314 \pm 0.015$
8200K	$x = 0.291 \pm 0.015$
	$y = 0.306 \pm 0.015$
9300K	$x = 0.283 \pm 0.015$
	$y = 0.297 \pm 0.015$
11500K	$x = 0.270 \pm 0.015$
	$y = 0.281 \pm 0.015$

DDC Data Re-programming

In case the DDC data memory IC or main EEPROM which storage all factory settings were replaced due to a defect, the serial numbers have to be re-programmed "Analog DDC IC, Digital DDC IC & EEPROM".

It is advised to re-soldered DDC IC and main EEPROM from the old board onto the new board if circuit board have been replaced, in this case the DDC data does not need to be re-programmed.

Additional information

Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA).

Extended Display Identification Data(EDID) information may be also obtained from VESA.

Configuration and procedure

"PI-EDID" The software is provided by IMS to upgrade the firmware of CPU.

PI-EDID Tools is for the interface between "Parallel Port of PC" and "15 pin-D-SUB connector of Monitor".

It is a windows-based program, which cannot be run in MS-DOS.

System and equipment requirements

1. An Pentium (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98/2000/XP and Port95NT.exe.
3. EDID Software "PI-EDID.exe"
4. ISP boardas shown in Fig. 1

And I2C Board Jump wire should follow J10 (short), J9 (open), J5/J6/ (1and 2 pin short) J7/J8 (1 and 2 pin short)

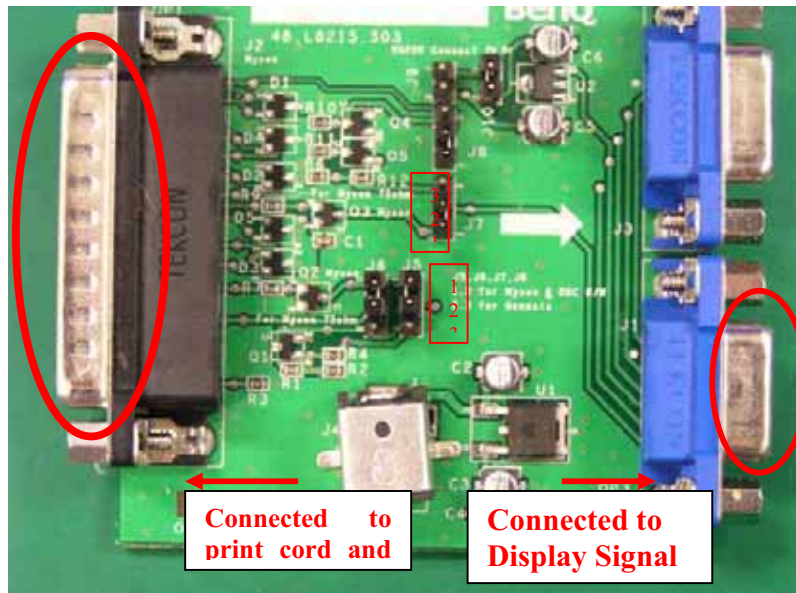


Fig.1

5. Connect and Mains cord to Monitor as shown in Fig.2.

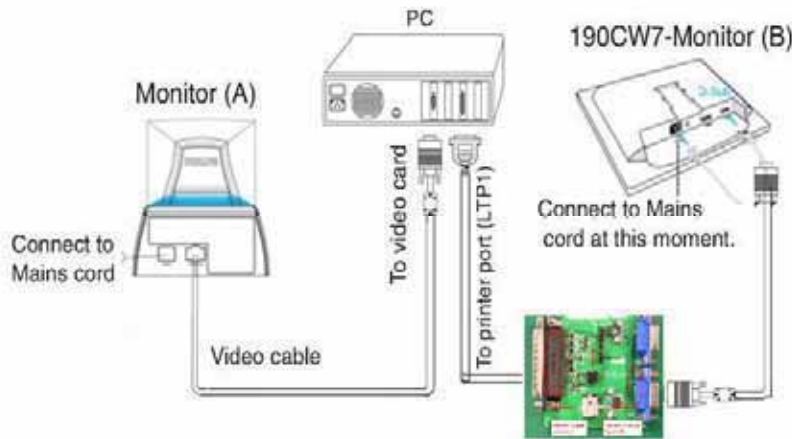
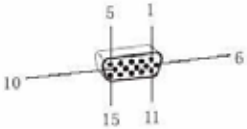


Fig.2

Pin assignment

A. 15-pin D-Sub Connector



PIN No.	SIGNAL
1	Red video input
2	Green video input / sync on green
3	Blue video input
4	GND
5	GND - Cable detect
6	Red video GND
7	Green video GND
8	Blue video - NO
9	DDC +3.3V or +5V
10	Logic GND
11	GND
12	Serial data line (SDA)
13	H-sync / H+V
14	V-sync
15	Data clock line (SCL)

B. Input DVI -D Connector pin



Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V) - Cable detect
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S. clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

Fig. 2a

6. Setup the Philips-IMS EDID Tools program

Step 1: Make a folder in your PC as shown in Fig. 3.

For example: C:\EDID

Step 2: Copy PI-EDID Software into your folder as shown in Fig.3.



Fig.3

Step 3: Copy the

LCD_Analog.ddc and LCD_DVI.ddc
to C:\EDID as shown in Fig. 4 .

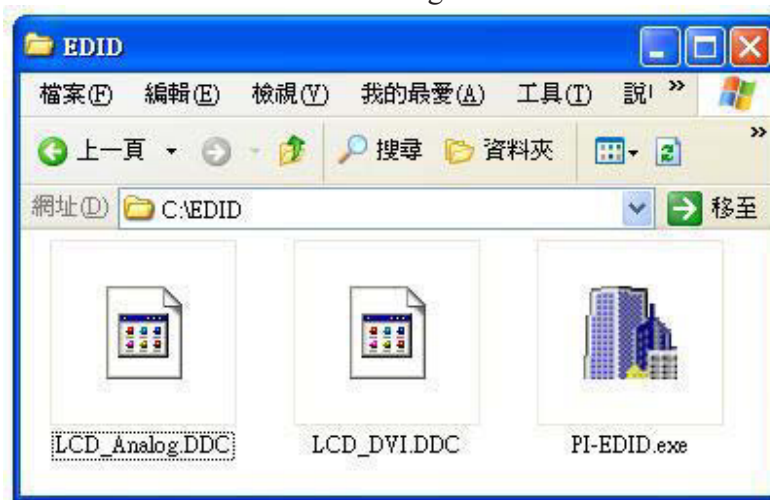


Fig.4

Update the DDC

1. Connect DSUB Cable to I2C Board.

Double click the PI-EDID.exe icon in desktop then appears window as shown in Fig.5.

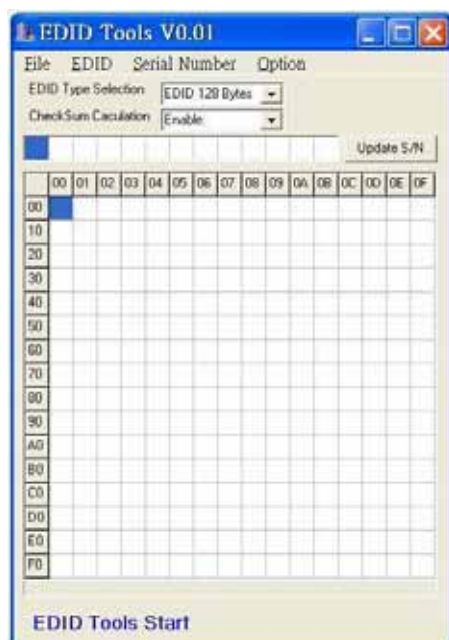


Fig.5

2. Press File->OPEN EDID to Load DDC file as shown in Fig.6.
Load Analog EDID file LCD_Analog.ddc to PI-EDID.exe

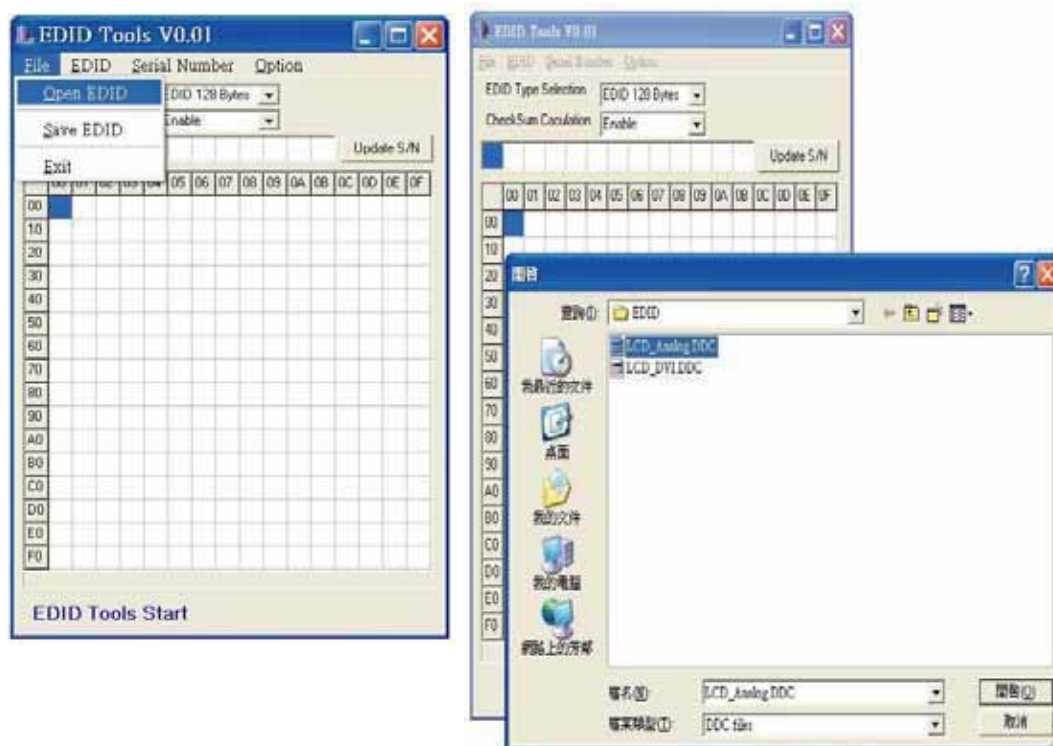


Fig.6

3. Load EDID file OK as shown in Fig.7.

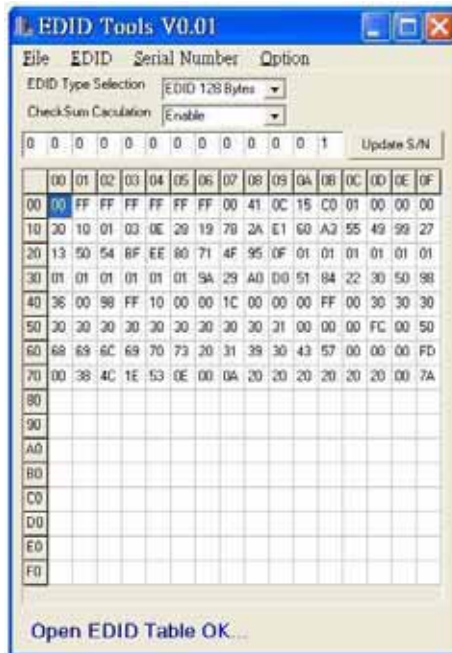


Fig.7

4. Modify Serial Number then Press “Update S/N” button as shown in Fig.8.

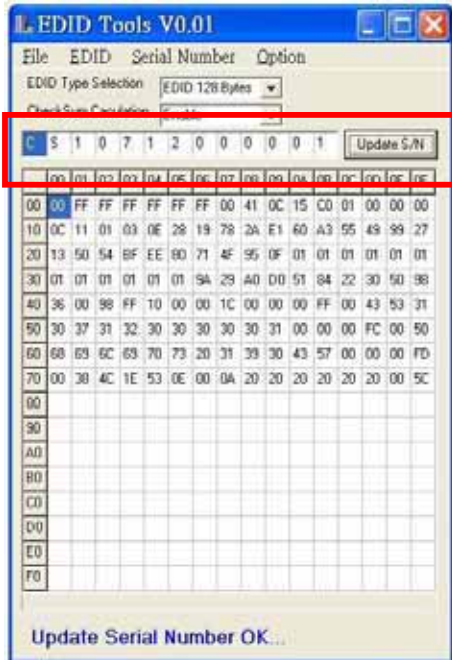


Fig.8

5. Press EDID->Write to write EDID data to EEPROM as shown in Fig. 9.

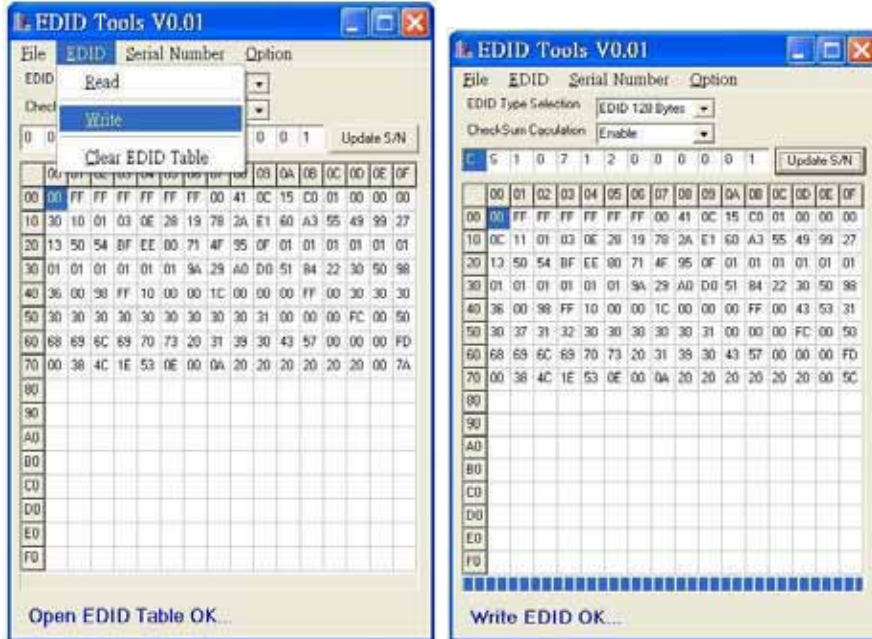


Fig.9

6. Connect DVI Cable to I2C Board.
Repeat Step 1~5 to write DVI EDID file.
7. Enter Factory Mode then Press the Serial Number->Write EDIDS/N to EEPROM as shown in Fig.10
Note: If not enter Factory Mode, this Wrote EDID S/N will not work.

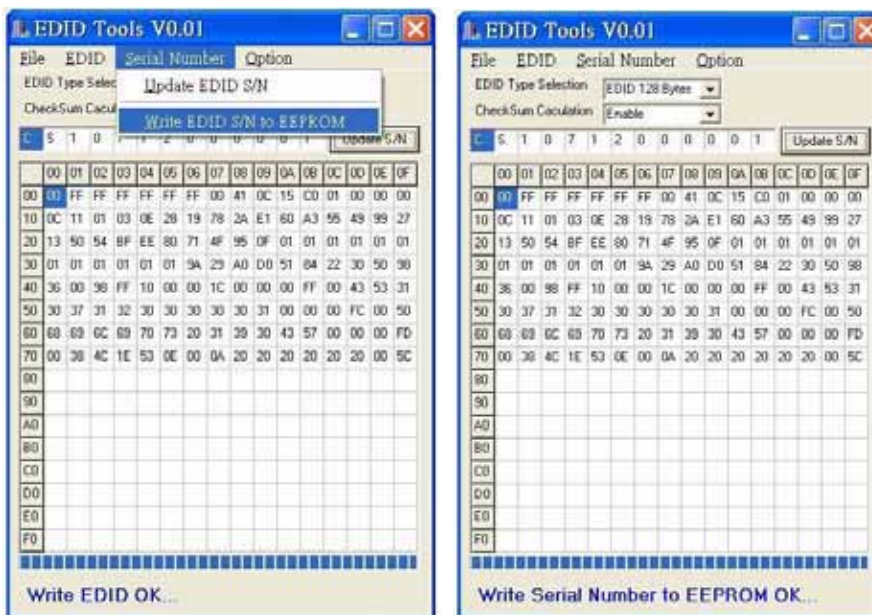


Fig.10

DDC instruction

8. Press Monitor Menu Key to check OSD Serial number is the same as PI-EDID write data as shown in Fig.10
 Note: If not the same, please rewrite EDID S/N again.

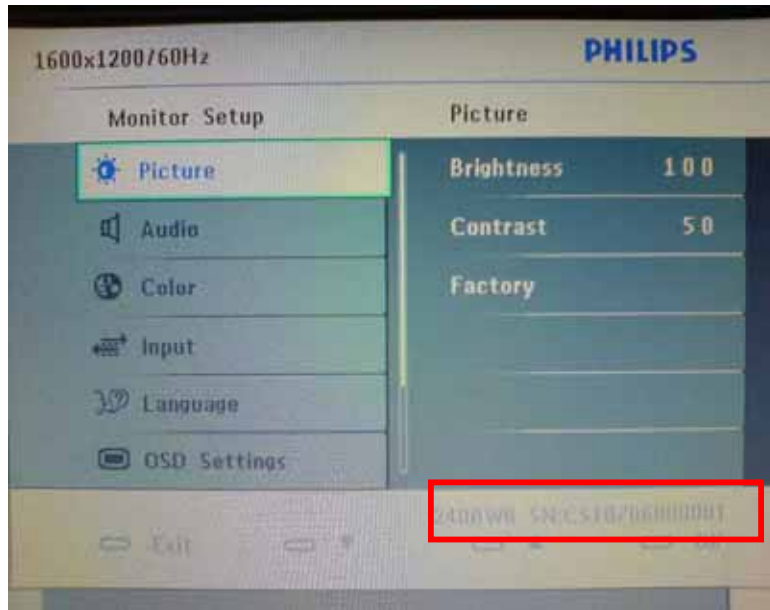
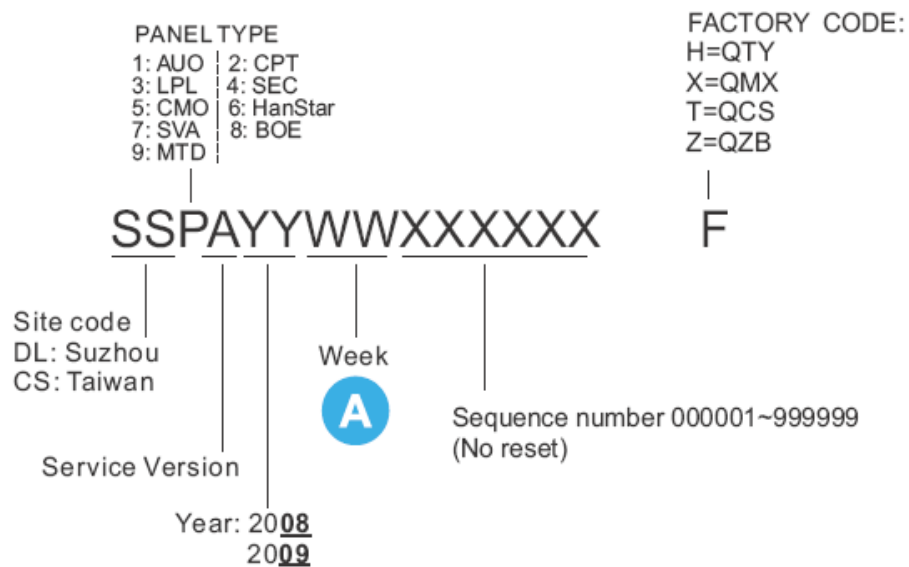


Fig.14

- 9 Turn off the monitor, exit the factory mode.

Serial Number Definition



DDC DATA

/////////Displaying Monitor EDID/////////

128 bytes EDID Data (Hex):

	0	1	2	3	4	5	6	7	8	9
0:	00	FF	FF	FF	FF	FF	FF	00	41	0C
10:	24	C0	01	00	00	00	0B	12	01	03
20:	0E	2F	1D	78	EE	B5	05	A5	56	4A
30:	9A	25	12	50	54	BF	EF	80	B3	00
40:	81	80	81	8F	95	00	95	0F	B3	0F
50:	A9	40	A9	4F	08	39	90	30	62	1A
60:	27	40	68	B0	36	00	DA	28	11	00
70:	00	1E	00	00	00	FF	00	43	53	33
80:	30	37	31	35	30	30	30	30	30	31
90:	00	00	00	FC	00	50	68	69	6C	69
100:	70	73	20	32	32	30	43	57	00	00
110:	00	FD	00	38	4C	1E	53	11	00	0A
120:	20	20	20	20	20	20	00	A8		

Decoded EDID data

<---Header--->

Header: 00 FF FF FF FF FF FF 00

<-x-Header-x->

<---Vendor/Product Identification--->

ID Manufacturer Name: PHL
 ID Product Code: 49188
 ID Serial Number: 00000001
 Week of Manufacture: 11
 Year of Manufacture: 2008

<-x-Vendor/Product Identification-x->

<---EDID Structure Version/Revision--->

EDID Version#: 1
 EDID Revision#: 3

<-x-EDID Structure Version/Revision-x->

<---Basic Display Parameters/Features--->

Video i/p definition: Analog
 Setup: Blank-to-Black not expected
 Seperate Syncs. support: Yes
 Composite Sync. support: Yes
 Vsync. Pulse: serration required
 Max Horz Image Size: 47 cm.
 Max Vert Image Size: 29 cm.
 Display Gamma: 2.2
 Display Type: RGB color display
 Standard Default Color Space: Yes
 Features, Preferred Timing Mode: In first detailed block
 Features, GTF support: No
 DPMS Features, Stand-by: Yes
 DPMS Features, Suspend: Yes
 DPMS Features, Active Off: Yes

<-x-Basic Display Parameters/Features-x->

<---Color Characteristics--->

Red x: 0.646484
 Red y: 0.338867
 Green x: 0.290039
 Green y: 0.602539
 Blue x: 0.144531
 Blue y: 7.03125e-002
 White x: 0.313477
 White y: 0.329102

<-x-Color Characteristics-x->

<---Established Timings--->

Established Timings 1: BF

- 720x400 @70Hz
 - 640x480 @60Hz
 - 640x480 @67Hz
 - 640x480 @72Hz
 - 640x480 @75Hz
 - 800x600 @56Hz
 - 800x600 @60Hz

Established Timings 2: EF

- 800x600 @72Hz
 - 800x600 @75Hz
 - 832x624 @75Hz
 - 1024x768 @60Hz
 - 1024x768 @70Hz
 - 1024x768 @75Hz
 - 1280x1024 @75Hz
 - 1152x870x75Hz

Established Timings 3: 80

<-x-Established Timings-x->

<---Standard Timing Identification--->

Standard Timing: 1680x1680 @60Hz
 Standard Timing: 1280x1024 @60Hz
 Standard Timing: 1280x1024 @75Hz
 Standard Timing: 1440x1440 @60Hz
 Standard Timing: 1440x1440 @75Hz
 Standard Timing: 1680x1680 @75Hz
 Standard Timing: 1600x1200 @60Hz
 Standard Timing: 1600x1200 @75Hz

<-x-Standard Timing Identification-x->

<---Detailed Timing Descriptions--->

Detailed Timing: 1680x1050 @59Hz
 Detailed Timing: FF (Monitor SN) 'CS30715000001'
 Detailed Timing: FC (Monitor name) 'Philips 220CW'
 Detailed Timing: FD (Monitor limits)

Vert: 56 - 76 Hz

Horz: 30 - 83 KHz

Clk: 170 MHz

<-x-Detailed Timing Descriptions-x->

Extension Flag: 00
 Checksum: A8

DDC DATA

/////////Displaying Monitor EDID/////////

128 bytes EDID Data (Hex):

	0	1	2	3	4	5	6	7	8	9
0:	00	FF	FF	FF	FF	FF	FF	00	41	0C
10:	24	C0	01	00	00	00	0B	12	01	03
20:	80	2F	1D	78	EE	B5	05	A5	56	4A
30:	9A	25	12	50	54	BF	EF	80	B3	00
40:	81	80	81	8F	95	00	95	0F	A9	40
50:	01	01	01	01	7C	2E	90	A0	60	1A
60:	1E	40	30	20	36	00	DA	28	11	00
70:	00	1A	00	00	00	FF	00	43	53	33
80:	30	37	31	35	30	30	30	30	30	31
90:	00	00	00	FC	00	50	68	69	6C	69
100:	70	73	20	32	32	30	43	57	00	00
110:	00	FD	00	38	4C	1E	53	11	00	0A
120:	20	20	20	20	20	20	00	EA		

Decoded EDID data

<---Header--->

Header: 00 FF FF FF FF FF FF 00

<-x-Header-x->

<---Vendor/Product Identification--->

ID Manufacturer Name: PHL
ID Product Code: 49188
ID Serial Number: 00000001
Week of Manufacture: 11
Year of Manufacture: 2008

<-x-Vendor/Product Identification-x->

<---EDID Structure Version/Revision--->

EDID Version#: 1
EDID Revision#: 3

<-x-EDID Structure Version/Revision-x->

<---Basic Display Parameters/Features--->

Video i/p definition: Analog
Setup: Blank-to-Black not expected
Seperate Syncs. support: No
Composite Sync. support: No
Vsync. Pulse: serration not required
Max Horz Image Size: 47 cm.
Max Vert Image Size: 29 cm.
Display Gamma: 2.2
Display Type: RGB color display
Standard Default Color Space: Yes
Features, Preferred Timing Mode: In first detailed block
Features, GTF support: No
DPMS Features, Stand-by: Yes
DPMS Features, Suspend: Yes
DPMS Features, Active Off: Yes

<-x-Basic Display Parameters/Features-x->

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Red y: 0.338867
Green x: 0.290039
Green y: 0.602539
Blue x: 0.144531
Blue y: 7.03125e-002
White x: 0.313477
White y: 0.329102

<-x-Color Characteristics-x->

<---Established Timings--->

Established Timings 1: BF
- 720x400 @70Hz
- 640x480 @60Hz
- 640x480 @67Hz
- 640x480 @72Hz
- 640x480 @75Hz
- 800x600 @56Hz
- 800x600 @60Hz

Established Timings 2: EF

- 800x600 @72Hz
- 800x600 @75Hz
- 832x624 @75Hz
- 1024x768 @60Hz
- 1024x768 @70Hz
- 1024x768 @75Hz
- 1280x1024 @75Hz
- 1152x870x75Hz

Established Timings 3: 80

<-x-Established Timings-x->

<---Standard Timing Identification--->

Standard Timing: 1680x1680 @60Hz
Standard Timing: 1280x1024 @60Hz
Standard Timing: 1280x1024 @75Hz
Standard Timing: 1440x1440 @60Hz
Standard Timing: 1440x1440 @75Hz
Standard Timing: 1600x1200 @60Hz

<-x-Standard Timing Identification-x->

<---Detailed Timing Descriptions--->

Detailed Timing: 1680x1050 @59Hz
Detailed Timing: FF (Monitor SN) 'CS30715000001'
Detailed Timing: FC (Monitor name) 'Philips 220CW'
Detailed Timing: FD (Monitor limits)
Vert: 56 - 76 Hz
Horz: 30 - 83 KHz
Clk: 170 MHz

<-x-Detailed Timing Descriptions-x->

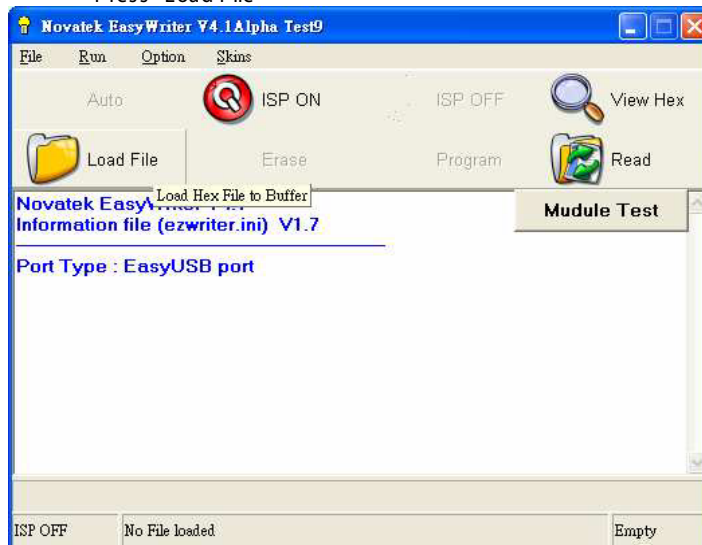
Extension Flag: 00
Checksum: EA

Step 1 : Install "Port95nt.exe"

Restart computer.

Step 2 : Double click "EasyUSB Writer\Writer_t9.exe"

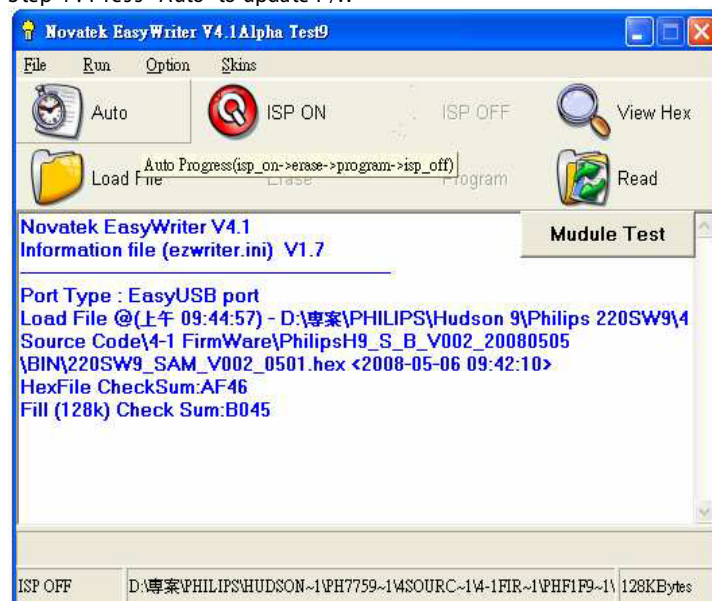
Press "Load File"



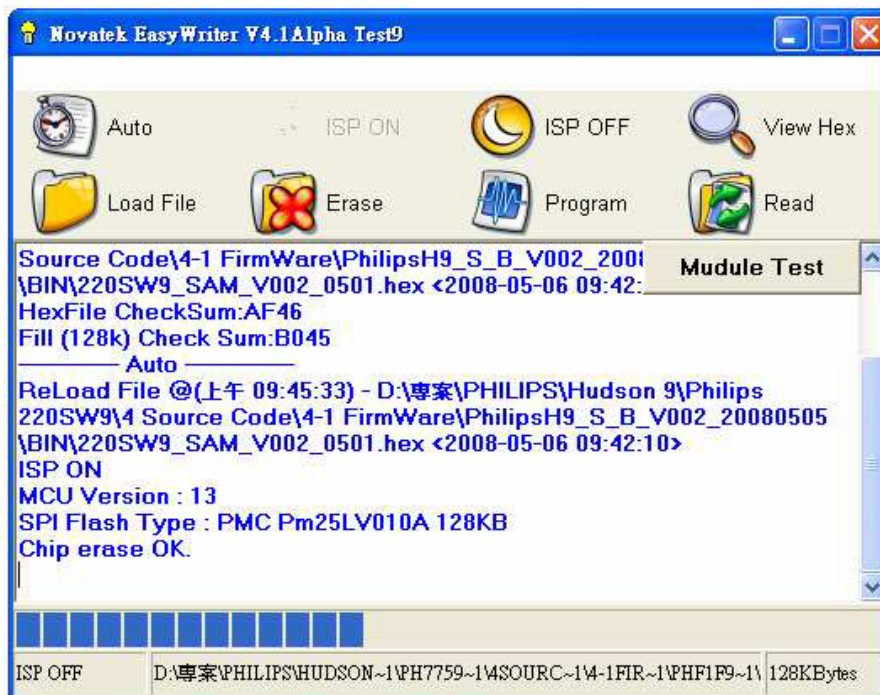
Step 3 : Choose *.hex



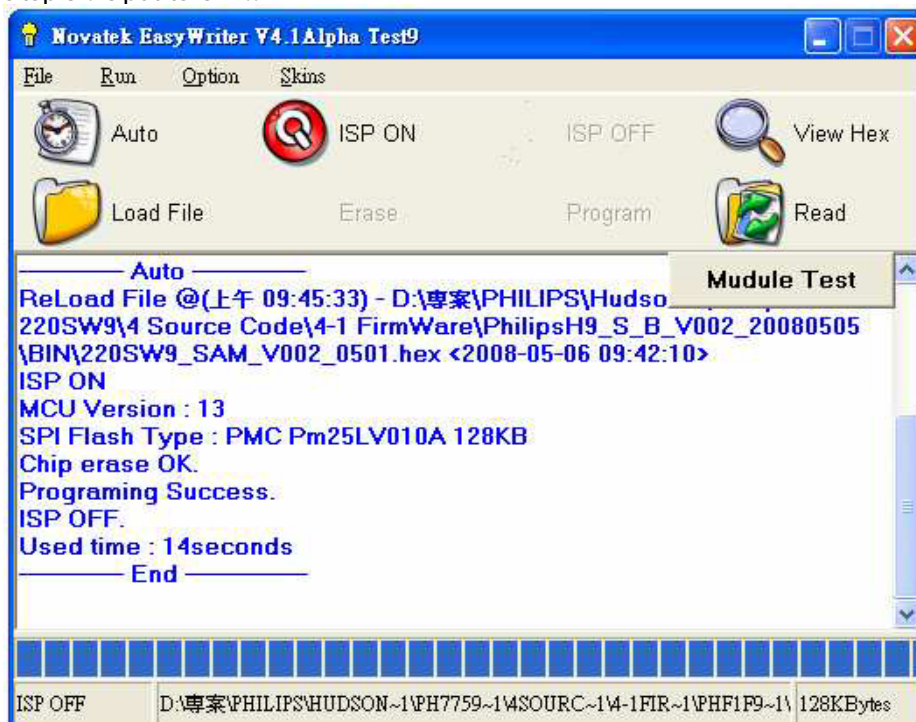
Step 4 : Press "Auto" to update F/W



Firmware Upgrade for CPU

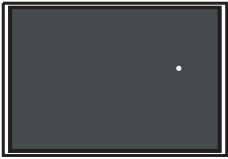
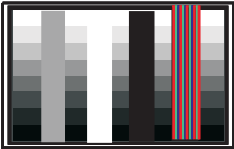
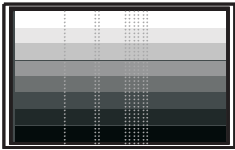
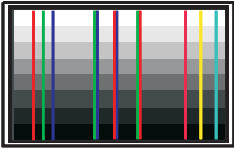
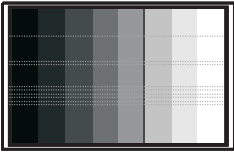
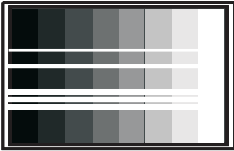
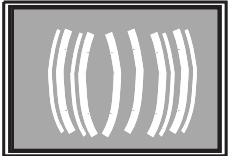
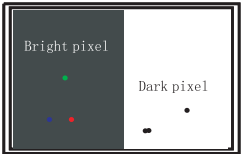


Step 5 : Update OK !!

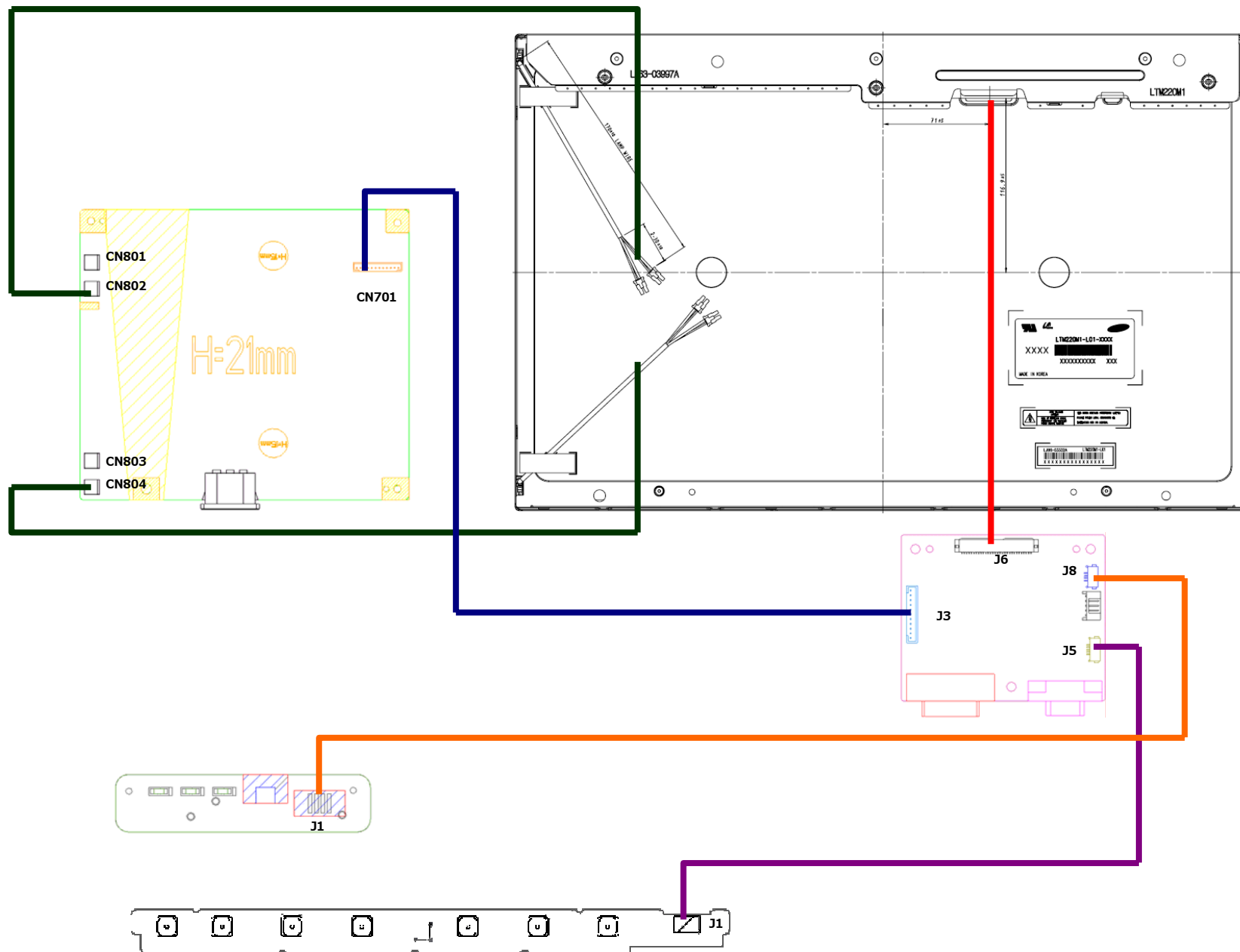


Quick reference for failure mode of LCD panel

this page presents problems that could be made by LCD panel.
It is not necessary to repair circuit board. Simply follow the mechanical
instruction on this manual to eliminate failure by replace LCD panel.

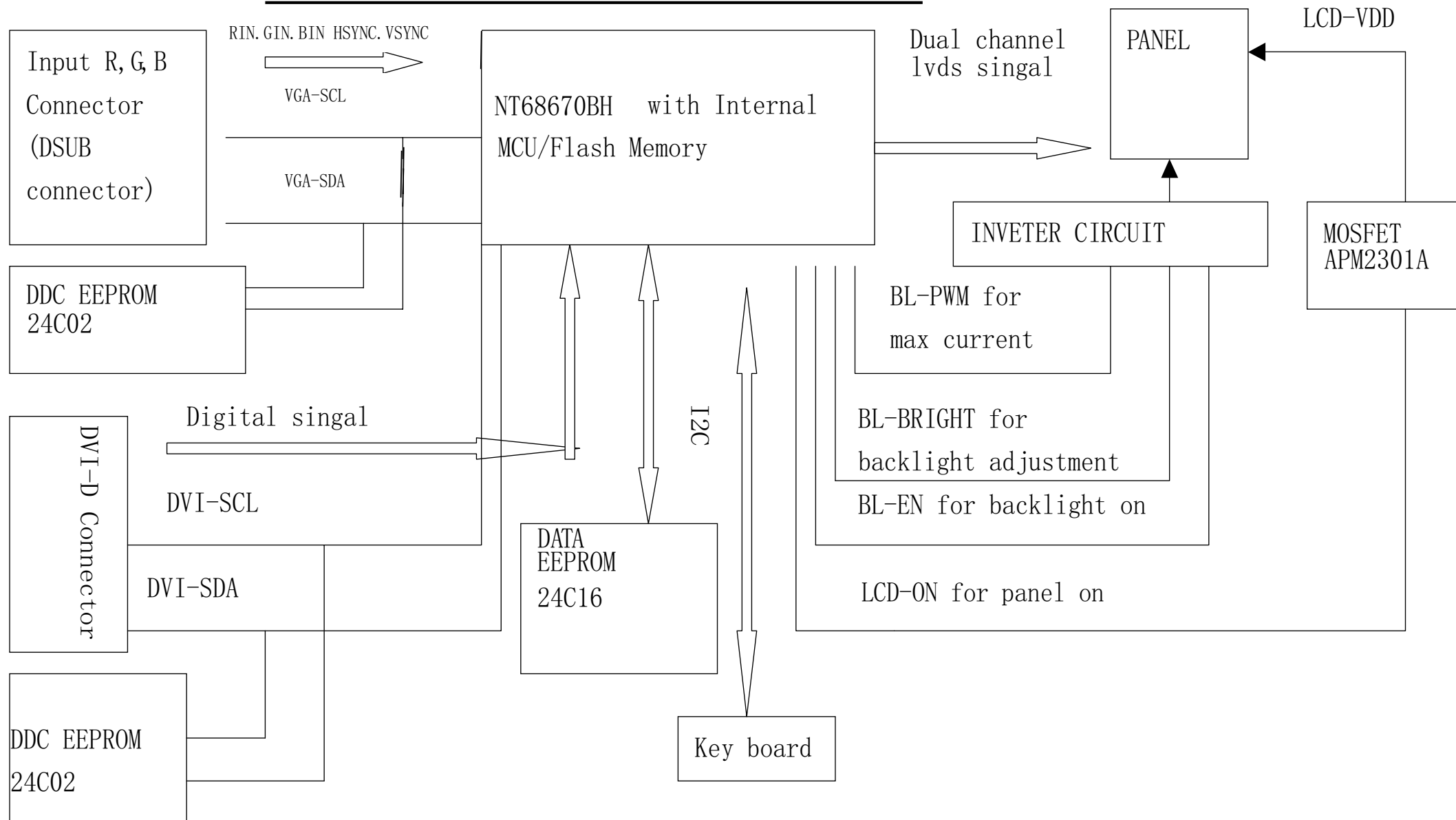
Failure description	Phenomenon		
		Polarizer has bubbles	
Vertical block defect		Polarizer has bubbles	
Vertical dim lines			
Vertical lines defect (Always bright or dark)		Foreign material inside polarizer. It shows liner or dot shape.	
Horizontal block defect		Concentric circle formed	
Horizontal dim lines		Bottom back light of LCD is brighter than normal	
Horizontal lines defect (Always bright or dark)		Back light un-uniformity	
Has bright or dark pixel		Backlight has foreign material. Black or white color, liner or circular type	

Wiring Diagram

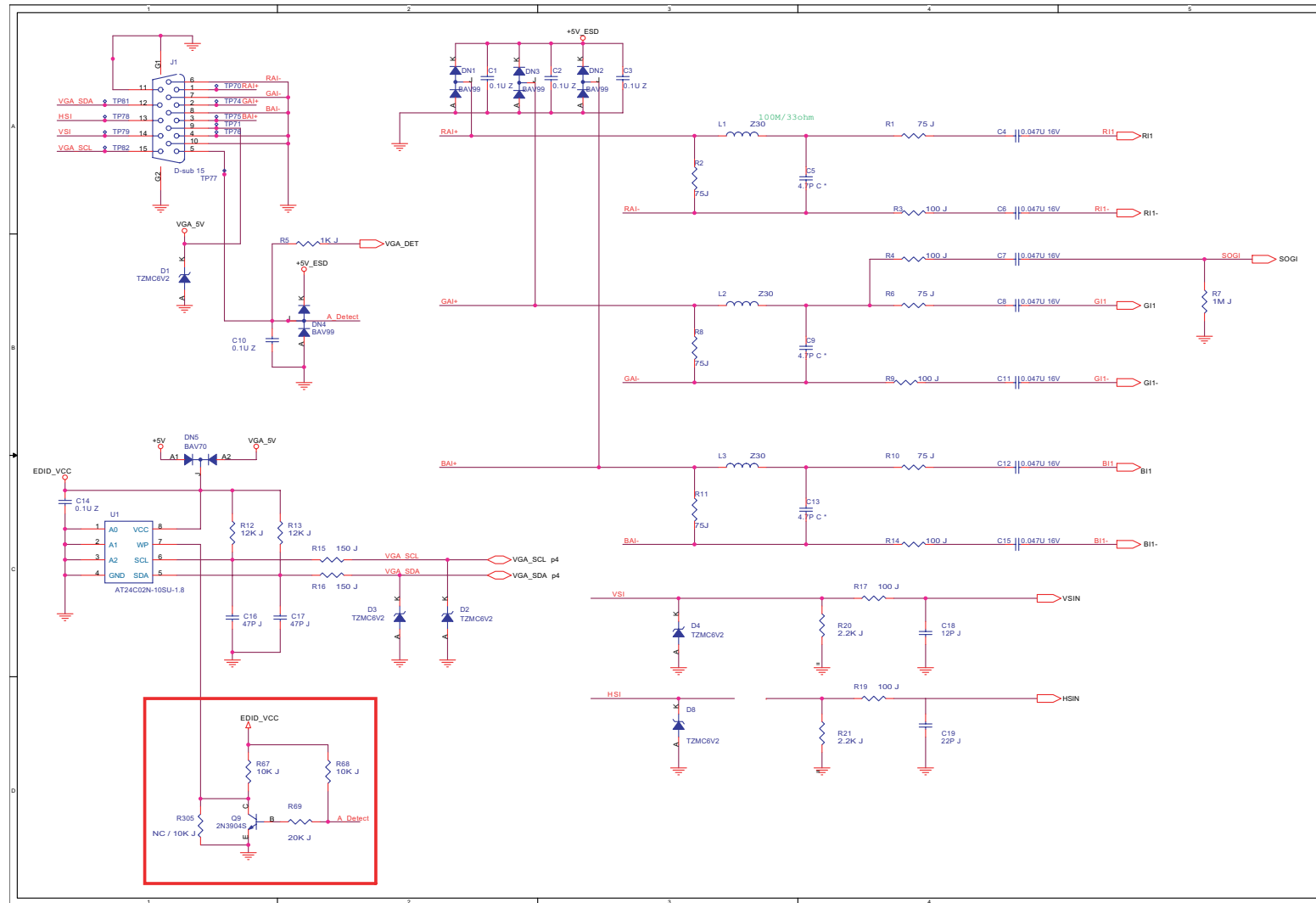


Block Diagram

PHILIPS 220CW9 MAIN BOARD BLOCK DIAGRAM

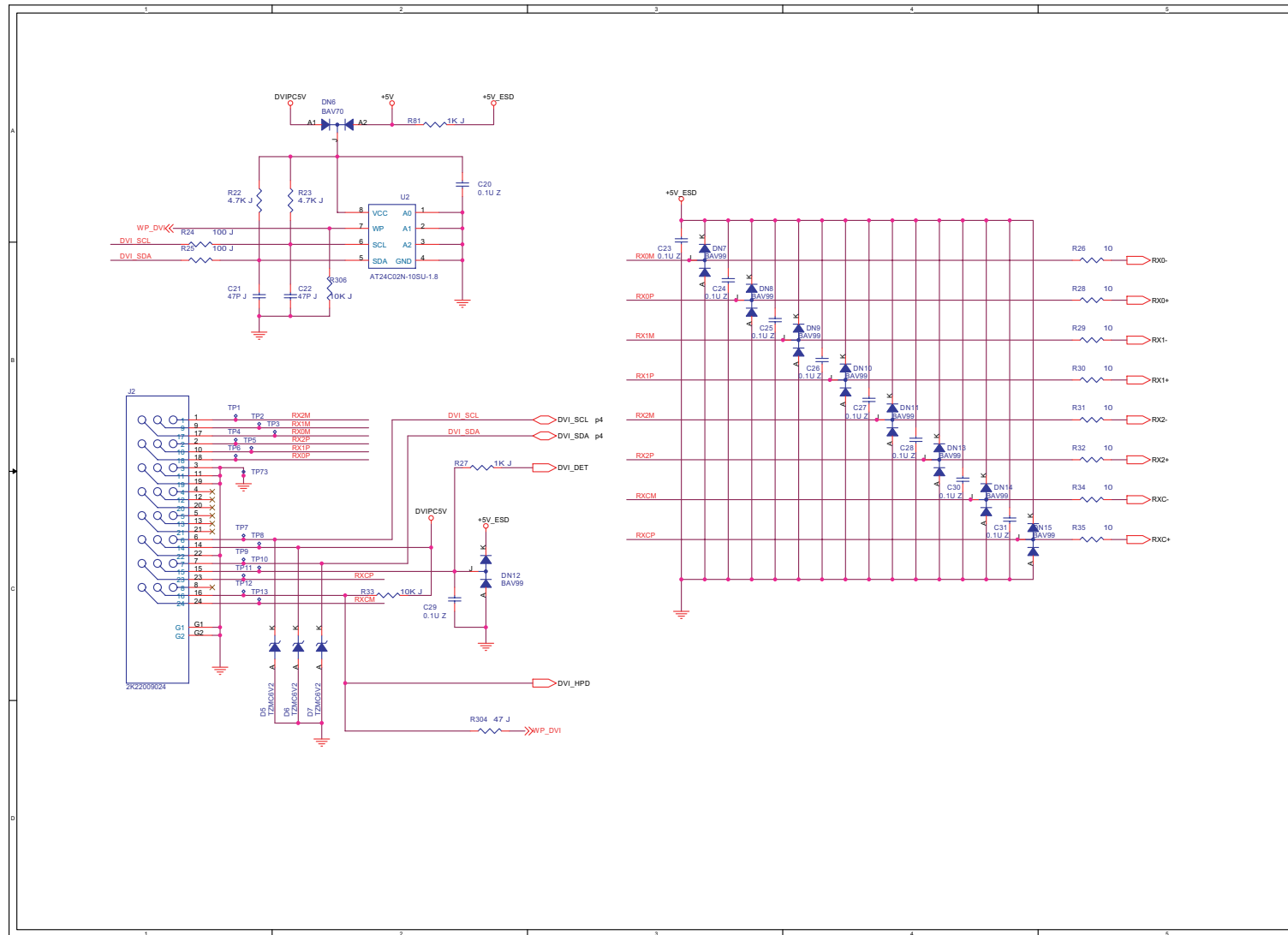


Scaler Diagram & C.B.A.



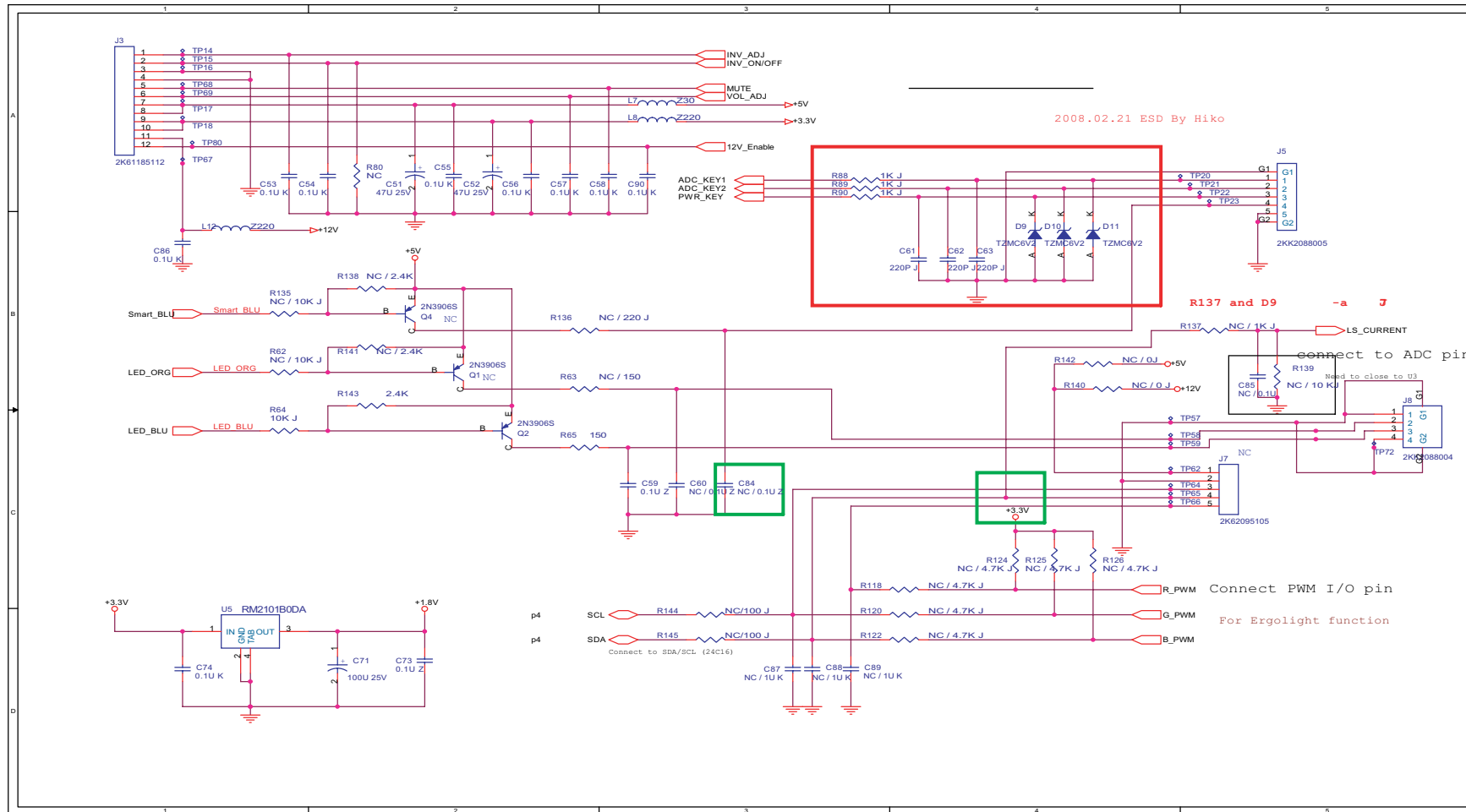
C1	A2
C10	B1
C11	B4
C12	C4
C13	C3
C14	C1
C15	C4
C16	C1
C17	C1
C18	C4
C19	D4
C2	A3
C3	A3
C4	A4
C5	A3
C6	A4
C7	B4
C8	B4
C9	B3
D1	B1
D2	C2
D3	C2
D4	C3
D8	D3
DN1	A2
DN2	A3
DN3	A2
DN4	B2
DN5	B1
J1	A1
L1	A3
L2	B3
L3	C3
Q9	D1
R1	A4
R10	C4
R11	C3
R12	C1
R13	C1
R14	C4
R15	C2
R16	C2
R17	C4
R18	D3
R19	D4
R2	A3
R20	C4
R21	D4
R3	A4
R4	B4
R5	A2
R6	B4
R67	D1
R68	D2
R69	D2
R7	B5
R8	B3
R9	B4
U1	C1

Scaler Diagram & C.B.A.

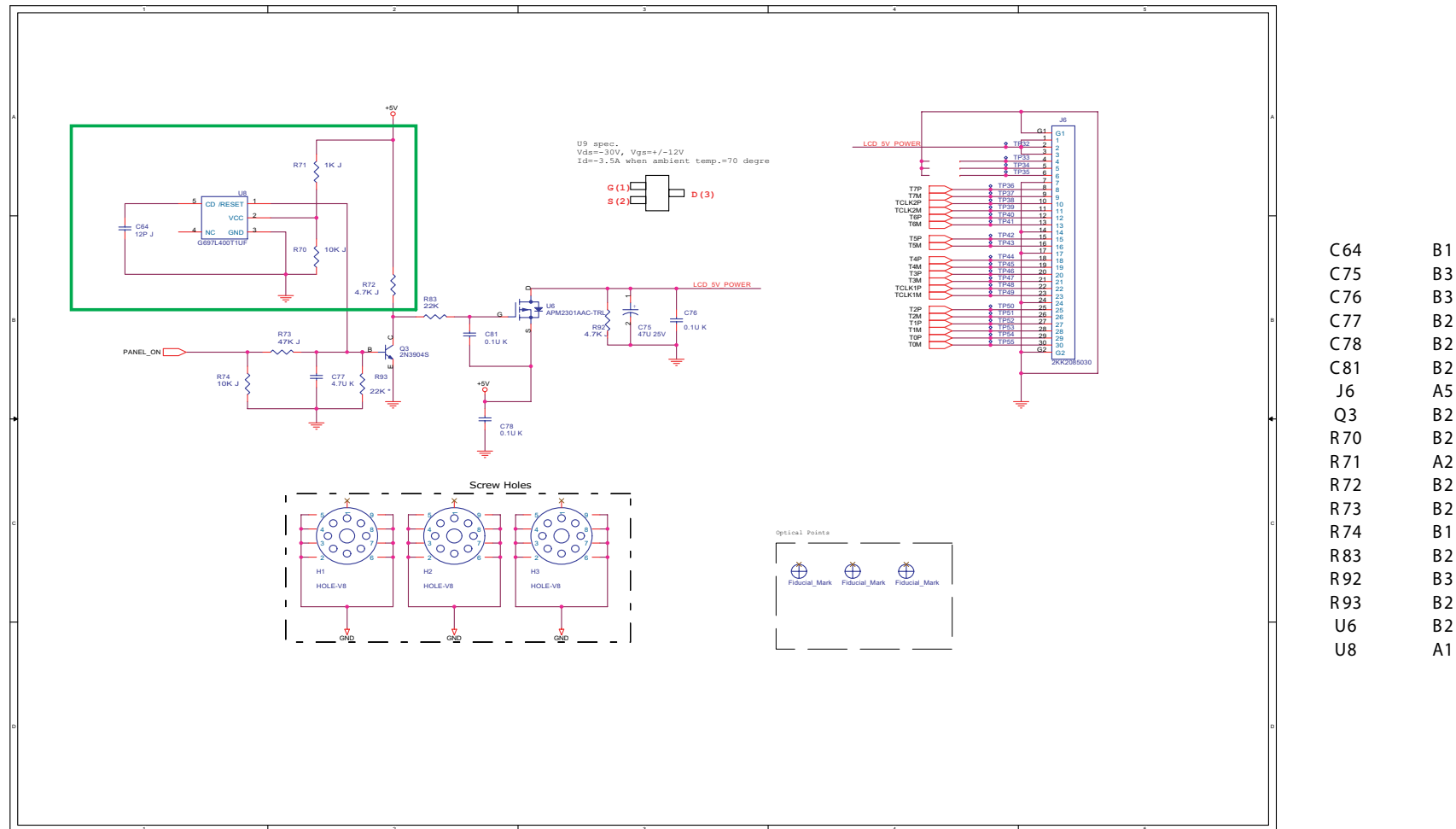


C20	A2
C21	B1
C22	B2
C23	A3
C24	B3
C25	B3
C26	B4
C27	B4
C28	B4
C29	C2
C30	C4
C31	C4
D5	C1
D6	C2
D7	C2
DN10	B4
DN11	B4
DN12	C2
DN13	B4
DN14	C4
DN15	C4
DN6	A2
DN7	A3
DN8	B3
DN9	B4
J2	B1
R22	A1
R23	A2
R24	A1
R25	B1
R26	B5
R27	B2
R28	B5
R29	B5
R30	B5
R304	D2
R306	B2
R31	B5
R32	B5
R33	C2
R34	C5
R35	C5
R81	A2
U2	A2

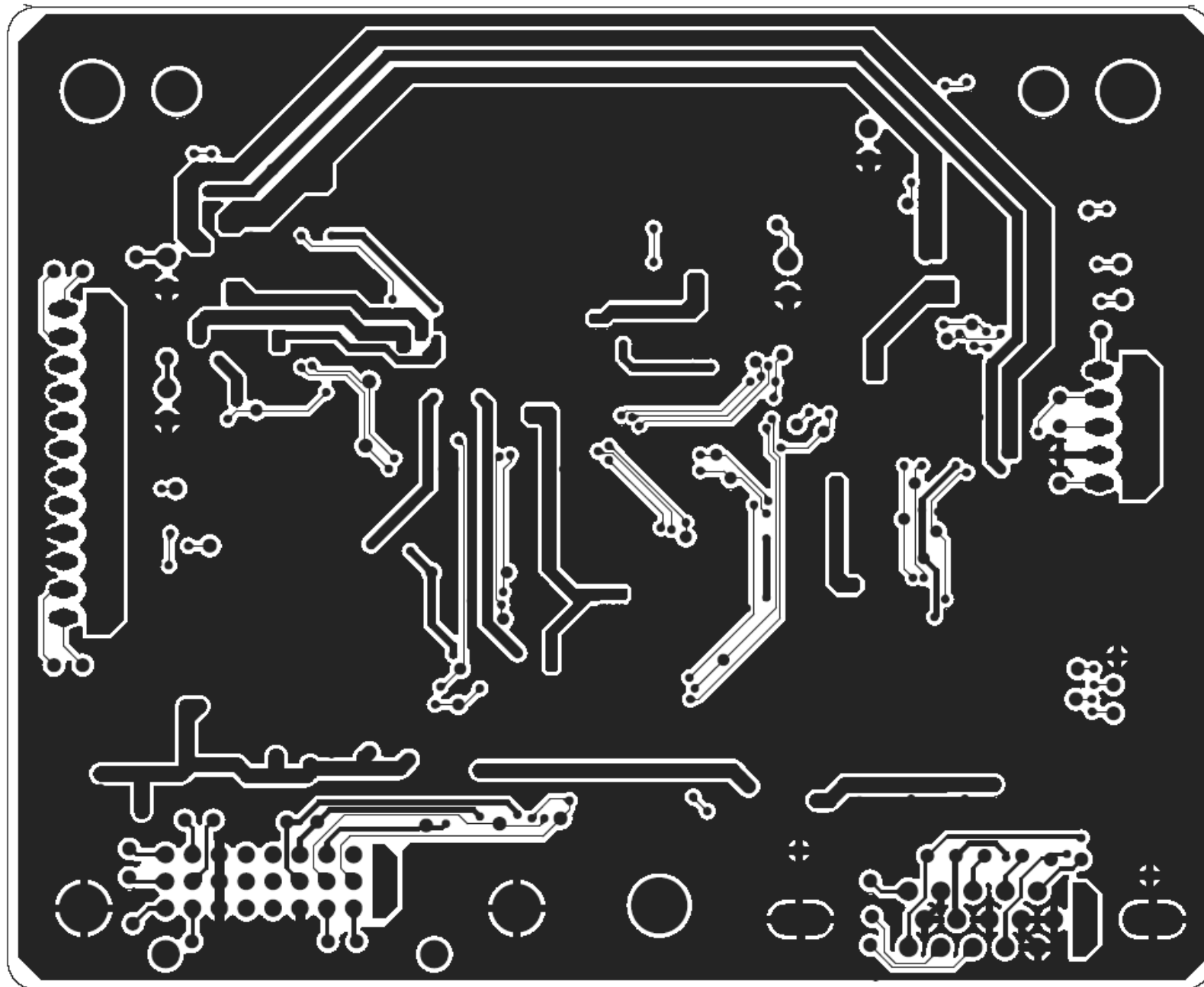
Scaler Diagram & C.B.A.



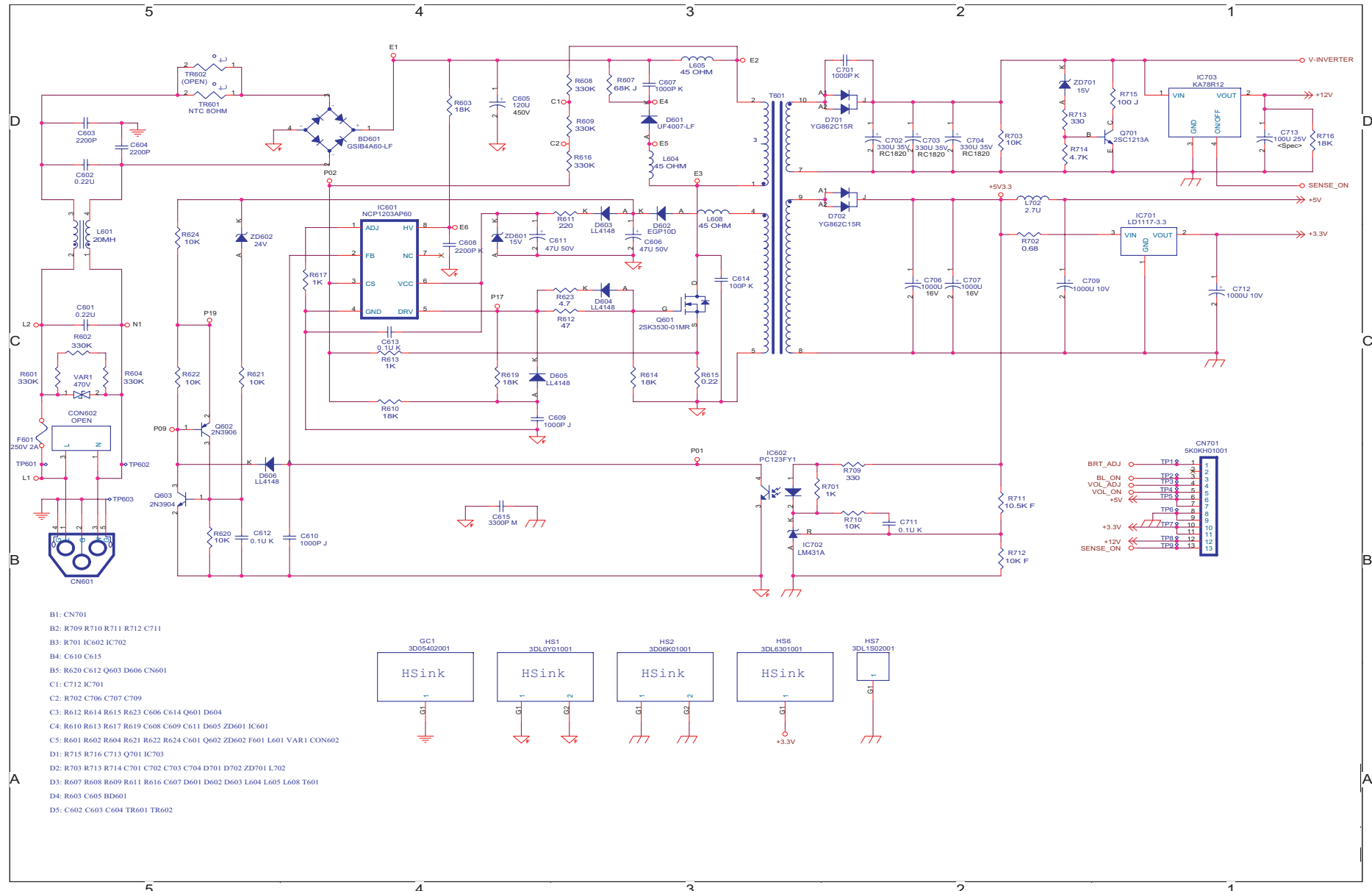
C51	A2
C52	A2
C53	A1
C54	A1
C55	A2
C56	A2
C57	A2
C58	A2
C59	B2
C61	A3
C62	A3
C63	A3
C71	C1
C73	C2
C74	C1
C86	A1
C90	A2
D10	A4
D11	A4
D9	A4
J3	A1
J5	A4
J8	B5
L12	A1
L7	A2
L8	A2
Q2	B2
R143	B2
R64	B1
R65	B2
R88	A3
R89	A3
R90	A3
U5	C1



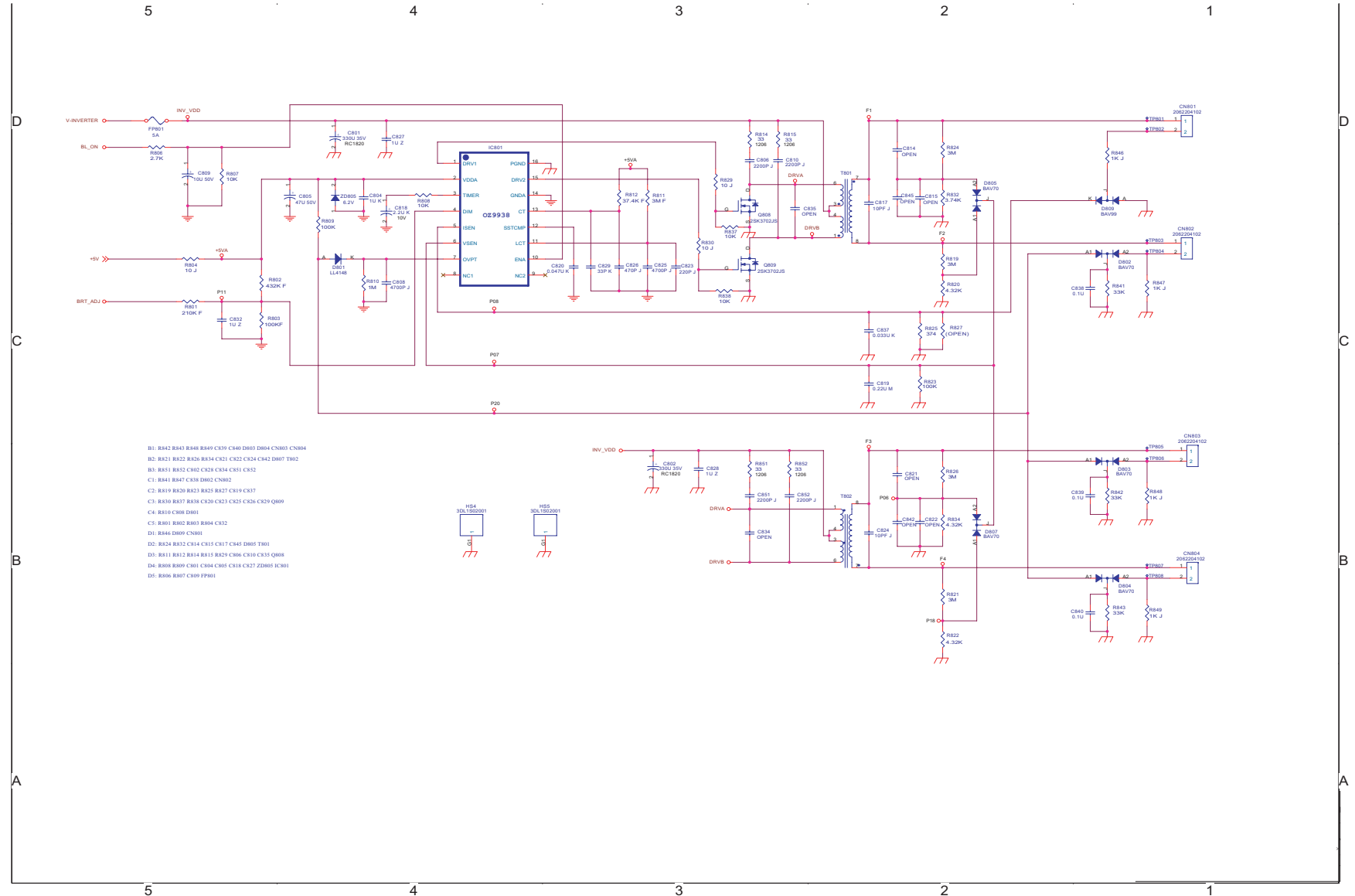
Scaler Diagram & C.B.A



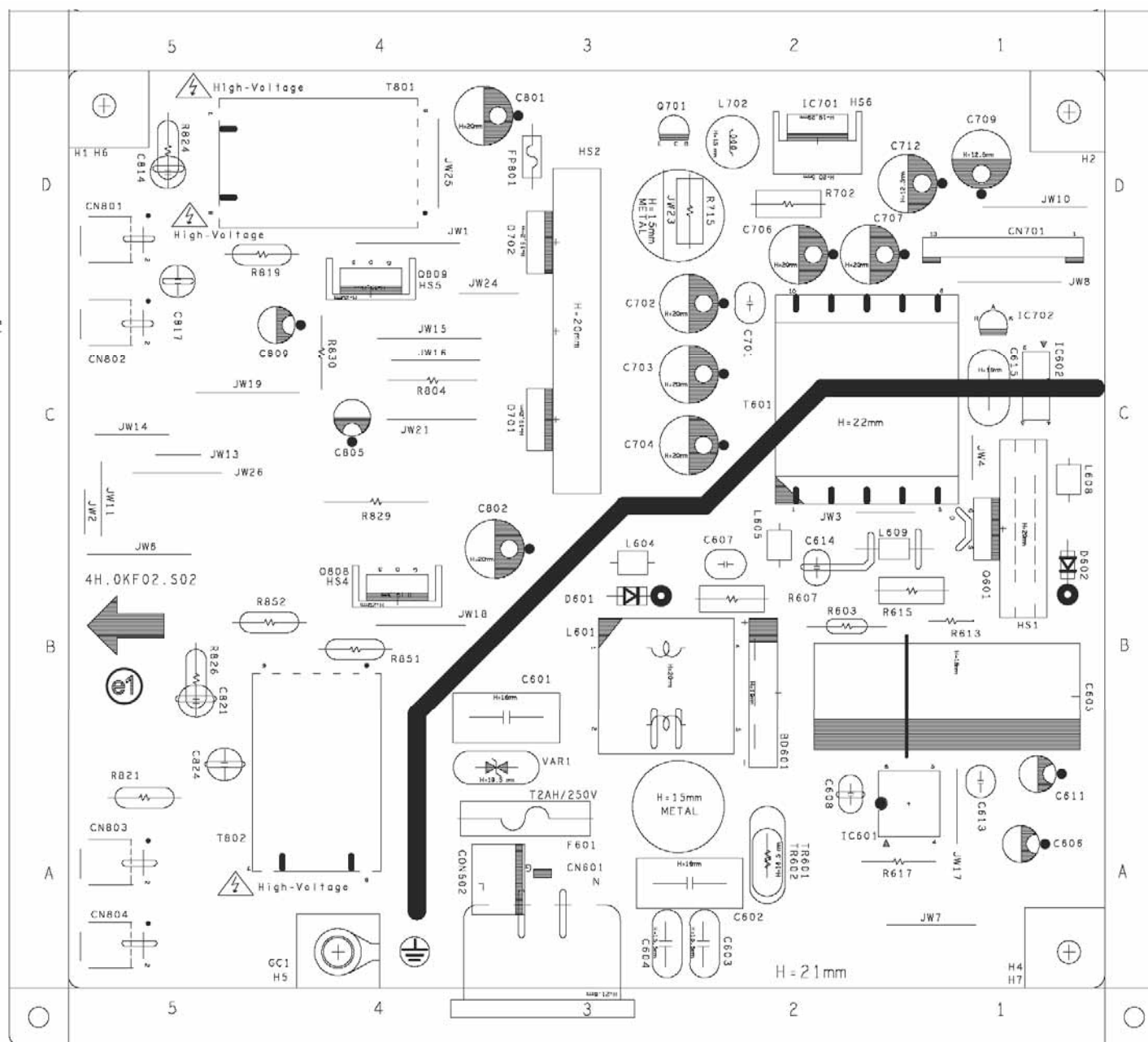
Power Diagram & C.B.A.



Power Diagram & C.B.A.

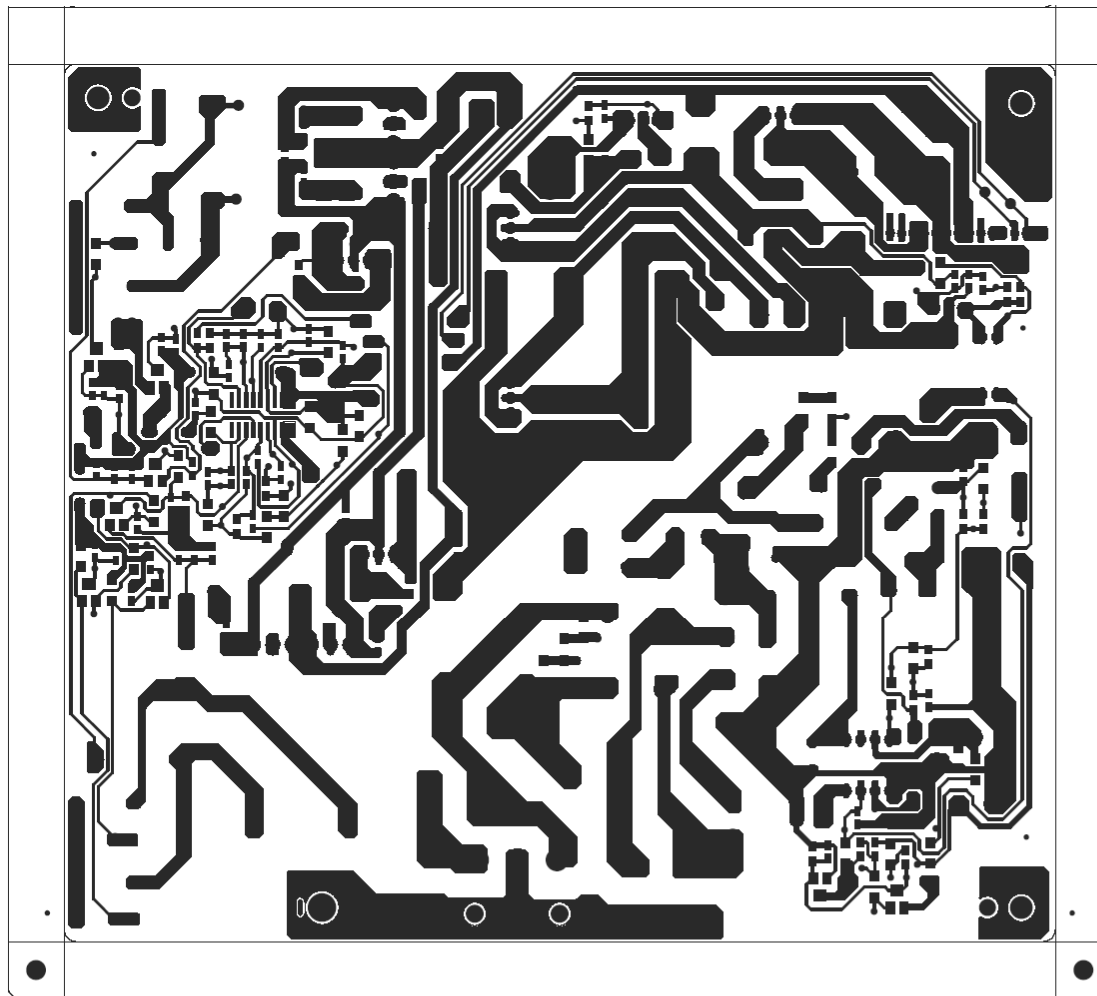


Power Diagram & C.B.A

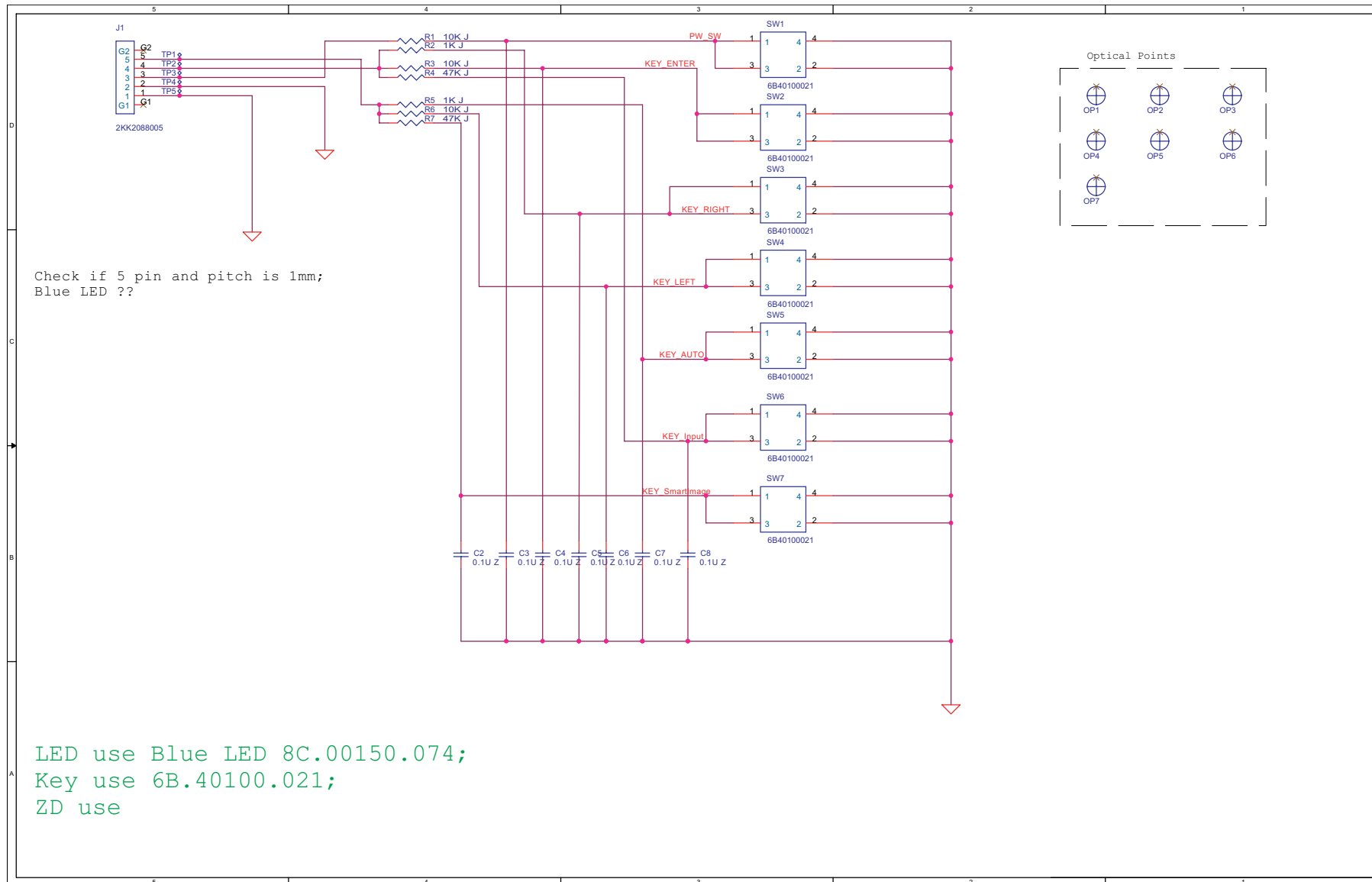


C4:	JW15	A1:	JW17
C4:	C805	A1:	JW13
C4:	R804	A1:	CC611
C4:	R830	A1:	CC606
C4:	R829	A1:	R617
C5:	JW26	A2:	CC608
C5:	JW19	A2:	TR602
C5:	JW14	A2:	JW7
C5:	JW13	A2:	CC602
C5:	CN802	A2:	TR601
C5:	CN809	A2:	IC601
D1:	CN701	A2:	CC603
D1:	JW8	A3:	CN601
D1:	JW10	A3:	F601
D1:	C709	A3:	VAR1
D2:	IC701	A3:	CC604
D2:	R702	A3:	CN602
D2:	C712	A4:	GC1
D2:	C707	A5:	CN804
D2:	C706	A5:	CN803
D3:	D702	B1:	DD602
D3:	FP801	B1:	DD613
D3:	JW23	B1:	DD615
D3:	Q701	B2:	CC605
D4:	Q809	B2:	CC614
D4:	JW24	B2:	CC603
D4:	JW1	B2:	CC609
D4:	C801	B2:	CC605
D5:	CN801	B2:	CC607
D5:	CN817	B2:	CC601
D5:	CN802	B2:	CC607
D5:	C809	B3:	DD604
D5:	R830	B3:	DD601
D5:	R829	B3:	DD604
D5:	Q808	B3:	DD601
D5:	HS4	B3:	DD601
D5:	R852	B3:	DD601
D5:	R851	B3:	DD601
D5:	R826	B3:	DD601
D5:	C821	B3:	DD601
D5:	C824	B3:	DD601
D5:	R821	B3:	DD601
D5:	CN803	B3:	DD601
D5:	CN804	B3:	DD601
D5:	T802	B3:	DD601
D5:	GC1	B3:	DD601
D5:	HS5	B3:	DD601
D5:	CN502	B3:	DD601
D5:	F601	B3:	DD601
D5:	CN601	B3:	DD601
D5:	C601	B3:	DD601
D5:	VAR1	B3:	DD601
D5:	T2AH/250V	B3:	DD601
D5:	C602	B3:	DD601
D5:	C603	B3:	DD601
D5:	C604	B3:	DD601
D5:	C605	B3:	DD601
D5:	C606	B3:	DD601
D5:	C607	B3:	DD601
D5:	C608	B3:	DD601
D5:	C609	B3:	DD601
D5:	C610	B3:	DD601
D5:	C611	B3:	DD601
D5:	C612	B3:	DD601
D5:	C613	B3:	DD601
D5:	C614	B3:	DD601
D5:	C615	B3:	DD601
D5:	C616	B3:	DD601
D5:	C617	B3:	DD601
D5:	C618	B3:	DD601
D5:	C619	B3:	DD601
D5:	C620	B3:	DD601
D5:	C621	B3:	DD601
D5:	C622	B3:	DD601
D5:	C623	B3:	DD601
D5:	C624	B3:	DD601
D5:	C625	B3:	DD601
D5:	C626	B3:	DD601
D5:	C627	B3:	DD601
D5:	C628	B3:	DD601
D5:	C629	B3:	DD601
D5:	C630	B3:	DD601
D5:	C631	B3:	DD601
D5:	C632	B3:	DD601
D5:	C633	B3:	DD601
D5:	C634	B3:	DD601
D5:	C635	B3:	DD601
D5:	C636	B3:	DD601
D5:	C637	B3:	DD601
D5:	C638	B3:	DD601
D5:	C639	B3:	DD601
D5:	C640	B3:	DD601
D5:	C641	B3:	DD601
D5:	C642	B3:	DD601
D5:	C643	B3:	DD601
D5:	C644	B3:	DD601
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D5:	C646	B3:	DD601
D5:	C647	B3:	DD601
D5:	C648	B3:	DD601
D5:	C649	B3:	DD601
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D5:	C658	B3:	DD601
D5:	C659	B3:	DD601
D5:	C660	B3:	DD601
D5:	C661	B3:	DD601
D5:	C662	B3:	DD601
D5:	C663	B3:	DD601
D5:	C664	B3:	DD601
D5:	C665	B3:	DD601
D5:	C666	B3:	DD601
D5:	C667	B3:	DD601
D5:	C668	B3:	DD601
D5:	C669	B3:	DD601
D5:	C670	B3:	DD601
D5:	C671	B3:	DD601
D5:	C672	B3:	DD601
D5:	C673	B3:	DD601
D5:	C674	B3:	DD601
D5:	C675	B3:	DD601
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D5:	C679	B3:	DD601
D5:	C680	B3:	DD601
D5:	C681	B3:	DD601
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D5:	C686	B3:	DD601
D5:	C687	B3:	DD601
D5:	C688	B3:	DD601
D5:	C689	B3:	DD601
D5:	C690	B3:	DD601
D5:	C691	B3:	DD601
D5:	C692	B3:	DD601
D5:	C693	B3:	DD601
D5:	C694	B3:	DD601
D5:	C695	B3:	DD601
D5:	C696	B3:	DD601
D5:	C697	B3:	DD601
D5:	C698	B3:	DD601
D5:	C699	B3:	DD601
D5:	C700	B3:	DD601
D5:	C701	B3:	DD601
D5:	C702	B3:	DD601
D5:	C703	B3:	DD601
D5:	C704	B3:	DD601
D5:	C705	B3:	DD601
D5:	C706	B3:	DD601
D5:	C707	B3:	DD601
D5:	C708	B3:	DD601
D5:	C709	B3:	DD601
D5:	C710	B3:	DD601
D5:	C711	B3:	DD601
D5:	C712	B3:	DD601
D5:	C713	B3:	DD601
D5:	C714	B3:	DD601
D5:	C715	B3:	DD601
D5:	C716	B3:	DD601
D5:	C717	B3:	DD601
D5:	C718	B3:	DD601
D5:	C719	B3:	DD601
D5:	C720	B3:	DD601
D5:	C721	B3:	DD601
D5:	C722	B3:	DD601
D5:	C723	B3:	DD601
D5:	C724	B3:	DD601
D5:	C725	B3:	DD601
D5:	C726	B3:	DD601
D5:	C727	B3:	DD601
D5:	C728	B3:	DD601
D5:	C729	B3:	DD601
D5:	C730	B3:	DD601
D5:	C731	B3:	DD601
D5:	C732	B3:	DD601
D5:	C733	B3:	DD601
D5:	C734	B3:	DD601
D5:	C735	B3:	DD601
D5:	C736	B3:	DD601
D5:	C737	B3:	DD601
D5:	C738	B3:	DD601
D5:	C739	B3:	DD601
D5:	C740	B3:	DD601
D5:	C741	B3:	DD601
D5:	C742	B3:	DD601
D5:	C743	B3:	DD601
D5:	C744	B3:	DD601
D5:	C745	B3:	DD601
D5:	C746	B3:	DD601
D5:	C747	B3:	DD601
D5:	C748	B3:	DD601
D5:	C749	B3:	DD601
D5:	C750	B3:	DD601
D5:	C751	B3:	DD601
D5:	C752	B3:	DD601
D5:	C753	B3:	DD601
D5:	C754	B3:	DD601
D5:	C755	B3:	DD601
D5:	C756	B3:	DD601
D5:	C757	B3:	DD601
D5:	C758	B3:	DD601
D5:	C759	B3:	DD601
D5:	C760	B3:	DD601
D5:	C761	B3:	DD601
D5:	C762	B3:	DD601
D5:	C763	B3:	DD601
D5:	C764	B3:	DD601
D5:	C765	B3:	DD601
D5:	C766	B3:	DD601
D5:	C767	B3:	DD601
D5:	C768	B3:	DD601
D5:	C769	B3:	DD601
D5:	C770	B3:	DD601
D5:	C771	B3:	DD601
D5:	C772	B3:	DD601
D5:	C773	B3:	DD601
D5:	C774	B3:	DD601
D5:	C775	B3:	DD601
D5:	C776	B3:	DD601
D5:	C777	B3:	DD601
D5:	C778	B3:	DD601
D5:	C779	B3:	DD601
D5:	C780	B3:	DD601
D5:	C781	B3:	DD601
D5:	C782	B3:	DD601
D5:	C783	B3:	DD601
D5:	C784	B3:	DD601
D5:	C785	B3:	DD601
D5:	C786	B3:	DD601
D5:	C787	B3:	DD601
D5:	C788	B3:	DD601
D5:	C789	B3:	DD601
D5:	C790	B3:	DD601
D5:	C791	B3:	DD601
D5:	C792	B3:	DD601
D5:	C793	B3:	DD601
D5:	C794	B3:	DD601
D5:	C795	B3:	DD601
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D5:	C797	B3:	DD601
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D5:	C804	B3:	DD601
D5:	C805	B3:	DD601
D5:	C806	B3:	DD601
D5:	C807	B3:	DD601
D5:	C808	B3:	DD601
D5:	C809	B3:	DD601
D5:	C810	B3:	DD601
D5:	C811	B3:	DD601
D5:	C812	B3:	DD601
D5:	C813	B3:	DD601
D5:	C814	B3:	DD601
D5:	C815	B3:	DD601
D5:	C816	B3:	DD601
D5:	C817	B3:	DD601
D5:	C818	B3:	DD601
D5:	C819	B3:	DD601
D5:	C820	B3:	DD601
D5:	C821	B3:	DD601
D5:	C822	B3:	DD601
D5:	C823	B3:	DD601
D5:	C824	B3:	DD601
D5:	C825	B3:	DD601
D5:	C826	B3:	DD601
D5:	C827	B3:	DD601
D5:	C828	B3:	DD601
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D5:	C830	B3:	DD601
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D5:	C833	B3:	DD601
D5:	C834	B3:	DD601
D5:	C835	B3:	DD601
D5:	C836	B3:	DD601
D5:	C837	B3:	DD601
D5:	C838	B3:	DD601
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D5:	C841	B3:	DD601
D5:	C842	B3:	DD601
D5:	C843	B3:	DD601
D5:	C844	B3:	DD601
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D5:	C849	B3:	DD601
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D5:	C865	B3:	DD601
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D5:	C882	B3:	DD601
D5:	C883	B3:	DD601
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D5:	C886	B3:	DD601
D5:	C887	B3:	

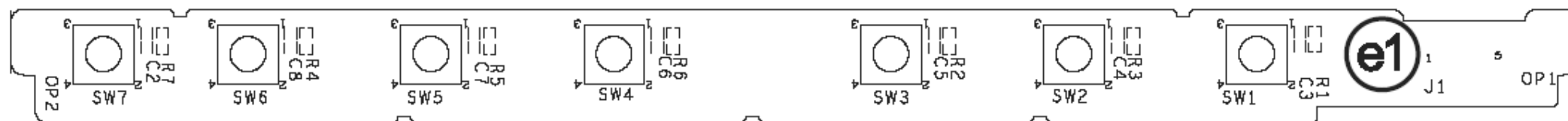
Power Diagram & C.B.A.



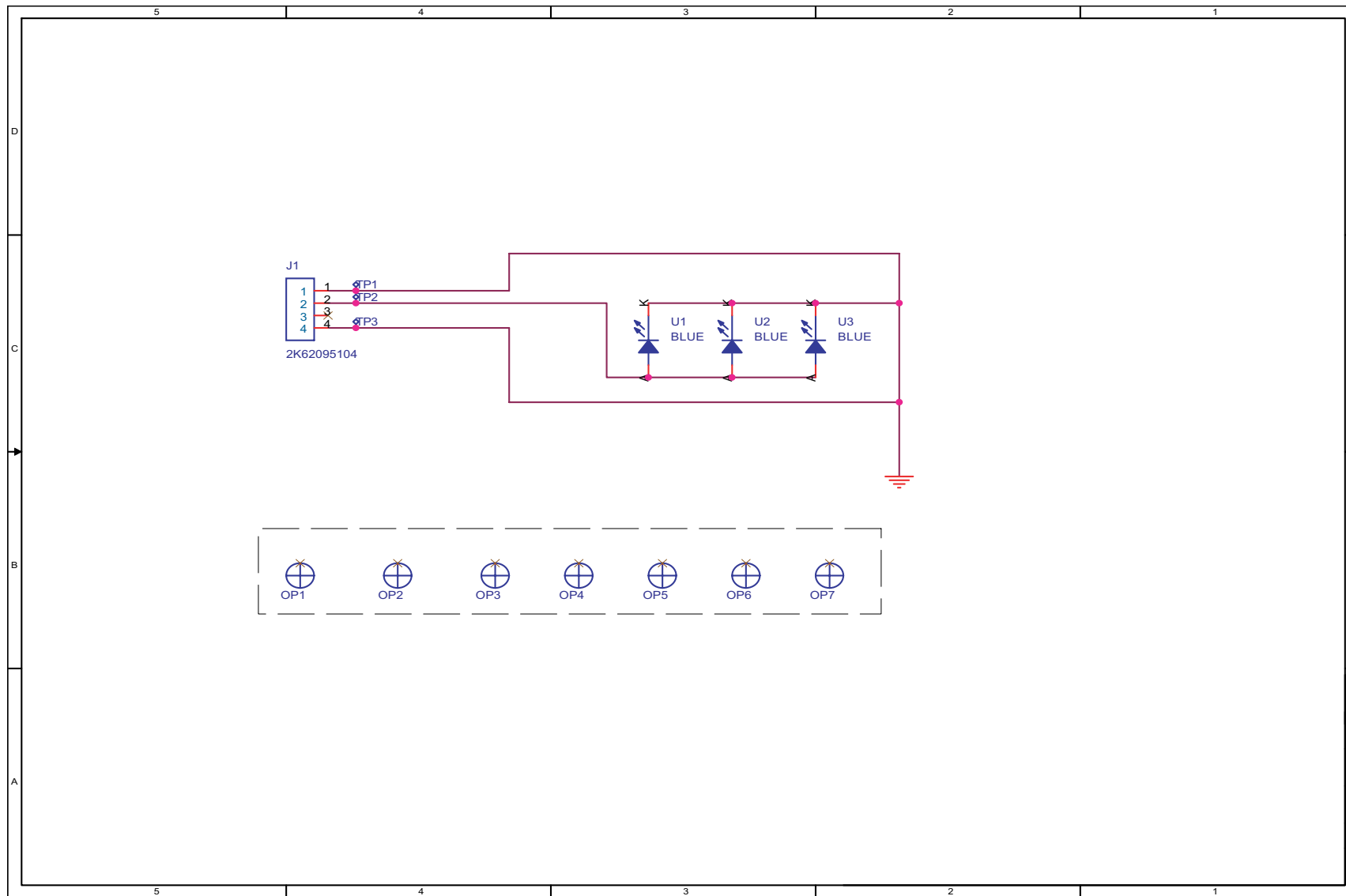
Control Diagram & C.B.A.



R1	D4
R3	D4
R6	D4
R2	D4
R5	D4
R4	D4
R7	D4
SW1	D3
SW2	D3
SW3	D3
SW4	C3
SW5	C3
SW6	C3
SW7	C3



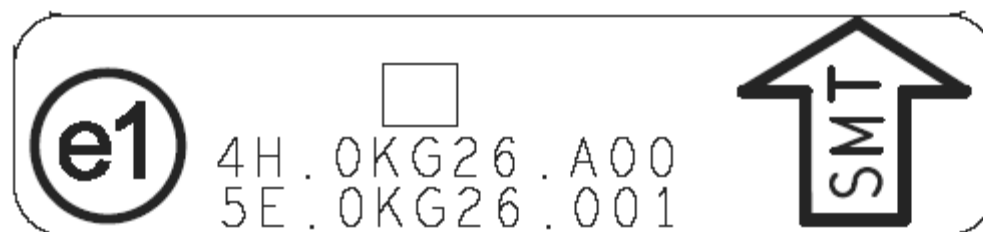
LED Diagram & C.B.A.



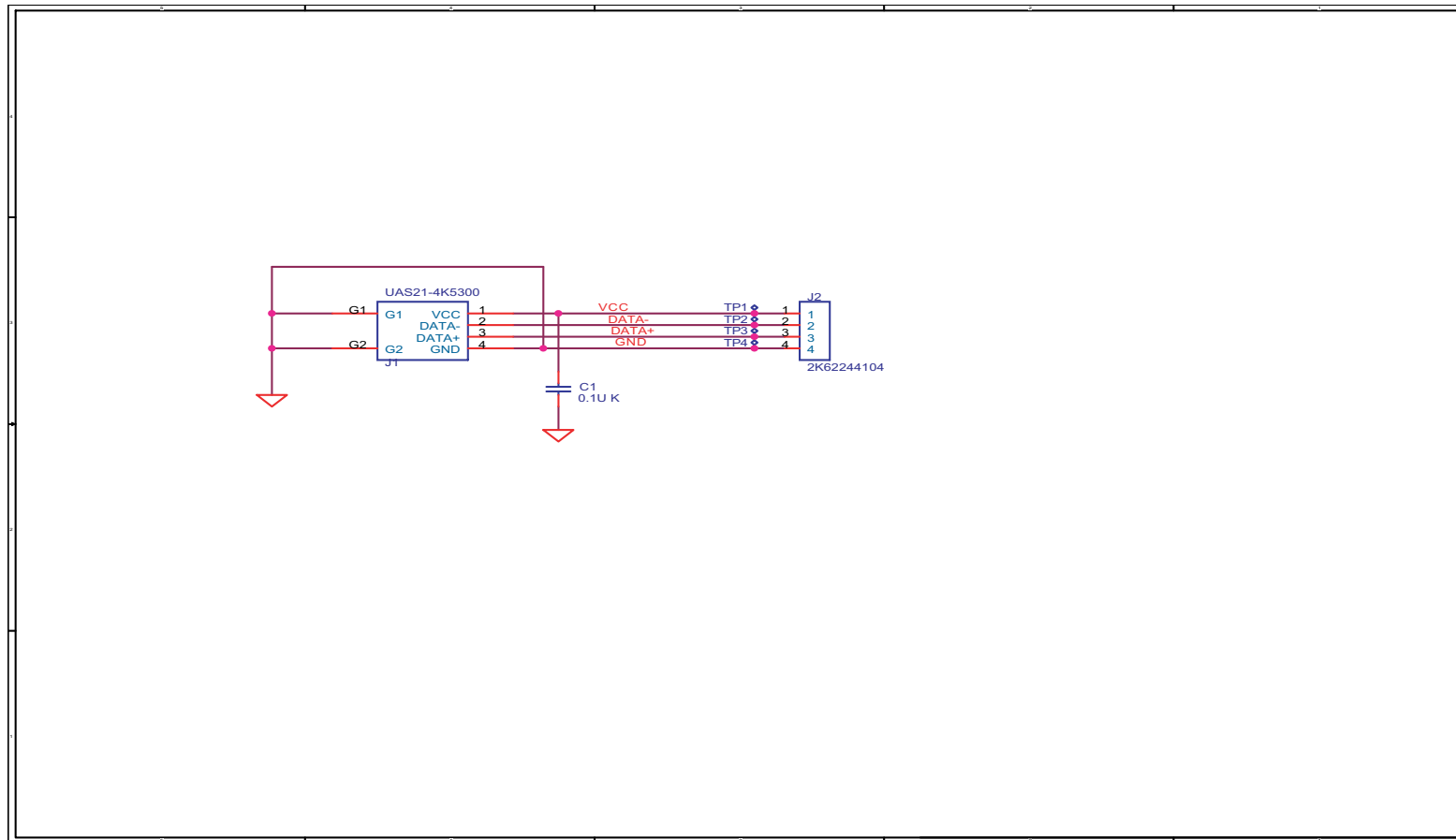
U1

C3

LED Diagram & C.B.A.



USB Diagram & C.B.A.



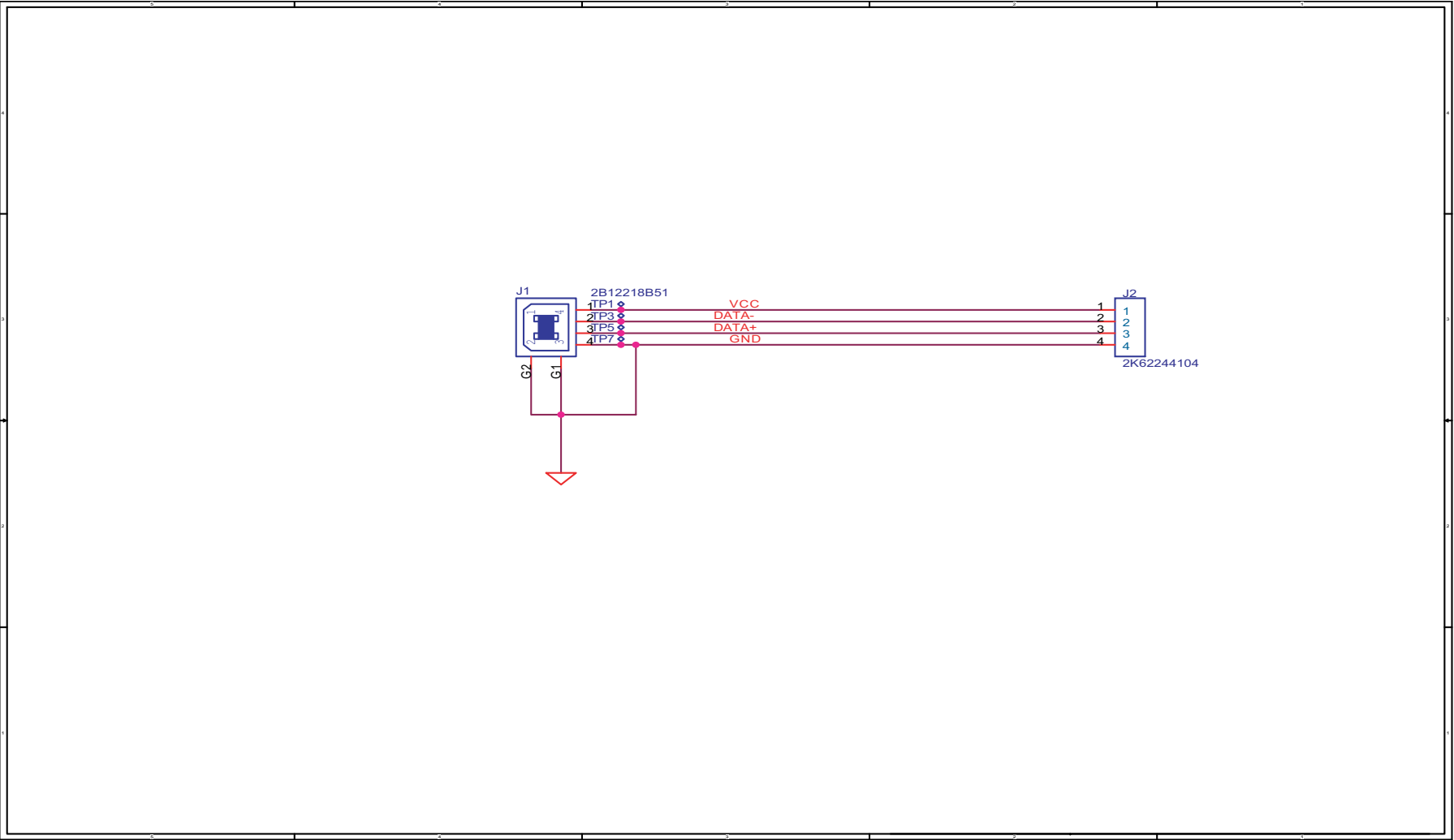
J1

J2

B2

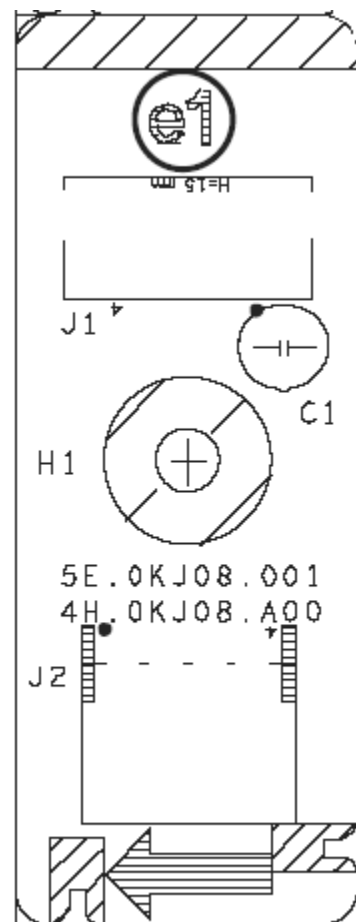
B3

USB Diagram & C.B.A.

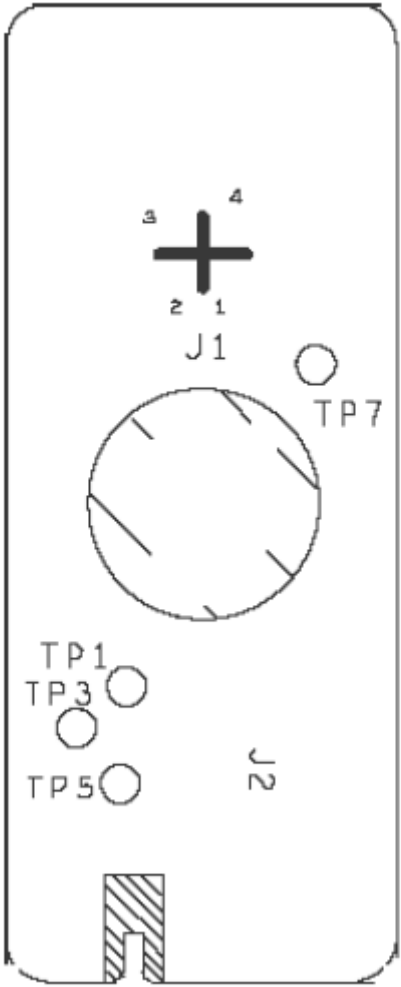


J1 B2
J2 B4

USB Diagram & C.B.A.



USB Diagram & C.B.A



General Product Specification

HUDSON 9-220 CW9 GENERAL PRODUCT SPECIFICATION

Issued by: Paul Tsai/ Argent Chan

Revision History

Ver.	Date (yy.mm.dd)	Author	Brief Description
0.1	2007.02.05	UC	Initiate version
0.2	2008.04.23	Paul	1) Update H9 timing table 2) Add BLUE Led blinking for standby mode 3) Modify sec 3.3.3 OSD behaviors

General Product Specification

- . ANALOG AND DIGITAL (optional) DUAL INPUT
- . AUTO PICTURE ADJUSTMENT
- . 18 FACTORY PRESET MODES AND 49 PRESET MODES WHICH CAN BE RECOVERED TO PRESET MODES, 10 USER MODES
- . USER FRIENDLY OSD DISPLAY FOR MODE IDENTIFICATION /ADJUSTMENT
- . MAX. RESOLUTION 1680 x 1050 NON-INTERLACED AT 76 HZ
- . 22" COLOR TFT LCD FLAT PANEL
- . FULL RANGE POWER SUPPLY 90 – 264 VAC
- . CE ENVIRONMENTAL POLICY
- . ANTI-GLARE TO REDUCE LIGHT REFLECTION
- . POWER MANAGEMENT CAPABILITY
- . SOG SUPPORT
- .Windows Vista Premium Logo Certification
- .HDCP support
- .USB PLUG
- .SMART CONTROL & SMART MANAGEMENT REQUIREMENT
- .SMART Contrast 10000:1(Typical) [SI to input exact measurement value](#)
- .SMART Image
- .SMART Response: **2ms(Typical), 4ms (Ave. max)**
- . TrueVision (formerly PerfectTunell or FGA, FACTORY GAMMA ALIGNMENT)
- . PHILIPS LOGO displayed while power on
- .WEEE REQUIREMENT

General Product Specification

.RoHS REQUIREMENT

.TCO06 REQUIREMENT

General Product Specification

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General Product Specification

1 FOREWORD

This specification describes a 22" SXGA multi-scan color TFT LCD monitor with maximum resolution up to 1680 x 1050 /60Hz non-interlaced. All optical characteristics (including WHITE-D, Brightness, and so on) are determined according to panel specification after warming up approximate 30 minutes that brightness stability is optimal, and follow strictly after panel specification.

2 PRODUCT PROFILE

This display monitor unit is a color display monitor enclosed in PHILIPS styling cabinet which has an integrated tilt base.

2.1 EDID Header

Data for EDID & .inf file

1	User visible strings on .inf file	Philips 220CW (22inch Wide LCD MONITOR 220CW9)
2	Manufacturer ID (EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): C0
		LSB (byte 11): 24
4	maximum resolution	1680x1050
5	Horizontal Frequency Range	30~83 KHz
6	Vertical Frequency Range	56~76Hz
7	Monitor Name (13 characters max.)	Philips 220CW

2.2 LCD (Waiting for suppliers input)

SEC

Type NR.	: SEC LTM220M1-L01
Resolution	: 1680 x 1050 (WSXGA+)
Outside dimensions	: 493.7(H) x 320.1(V) Typ. x 17.0(D) Max.
Pitch (mm)	: 0.282mm x 0.282mm
Color pixel arrangement	: RGB vertical stripe
Display surface	: Haze 25% Hard coating (3H)
Color depth	: 16.7M (6 bit Hi-FRC)
Backlight	: 4 CCFL
Active area (W x H)	: 473.76(H) x 296.1(V) mm
View angle (CR=10)	: =160 for Right/Left (Typ)
	: =160 for Up/Down (Typ)
Contrast ratio	: 1000:1 (Typ)
White luminance	: 300(Typ.)
Color gamut	: >=72%

General Product Specification

Gate IC : TOSHIBA
 Source IC : NEC
 Response time : Tr + Tf ≤ 5 ms (Typ)
 Vertical frequency range : 53~76Hz

LPL

Type NR. : LPL LM220WE1-TLE2/4
 Resolution : 1680 x 1050 (WSXGA+)
 Outside dimensions : 493.7(H) x 320.1 (V) x 16.5(D) mm (Typ.)
 Pitch (mm) : 0.282mm x 0.282mm
 Color pixel arrangement : 1680 horizontal By 1050 vertical Pixels. RGB stripe arrangement
 Display surface : Hard coating (3H), Anti-glare treatment of the front polarizer
 Color depth : 16.7M colors
 Backlight : 4 CCFL
 Active area (W x H) : 21.995 inches(558.673mm) diagonal (Aspect ratio 16:10)
 View angle (CR≥10) : R/L 170(Typ.), U/D 160(Typ.)
 Contrast ratio : >1000:1 (Typ)
 White luminance : 300 cd/m2(Typ. Center 1 point)
 Color gamut : ≥72%
 Gate IC : N/A
 Source IC : Magna , OKI
 Response time : ≤5 ms (Typ)
 Vertical frequency range : 50~75Hz

2.3 Scanning frequencies

Hor. : 30 – 83 K Hz

Ver. : 56 - 76 Hz

Video dot rate: < 210 MHz for VGA and < 170 MHz for DVI, warning message must be displayed while over 165 MHz (supplier to provide accurate scaler bandwidth number)

Power input: 90-264 V AC, 50/60 ± 2 Hz

Power consumption : <50W maximum, <45W (typ.)

< TBDWatt (with audio)

Functions:

(1) D-SUB analog R/G/B separate inputs, H/V sync separated, Composite (H+V) TTL level, SOG sync

(2) DVI digital Panel Link TMDS inputs, HDCP supported.

2.4 Ambient temperature: 0 °C - 40 °C

3 Electrical characteristics

3.1 Interface signals

1). D-Sub Analog

Input signal: Video, Hsync., Vsync

Video: 0.7 Vp-p, input impedance, 75 ohm @DC

General Product Specification

terminate Sync.: Separate sync TTL level , input impedance 2.2k ohm

Hsync Positive/Negative

Vsync Positive/Negative

Composite sync TTL level, input impedance 2.2k ohm terminate
(Positive/Negative)

Sync on green video 0.3 Vp-p Negative (Video 0.7 Vp-p Positive)

2). DVI-D Digital

Input signal: Single TMDS link (Three channels: RX0-/+, RX1-/+, RX2-/+)

3). USB PLUG

USB port (1 upstream, 1 downstream)

3.2 Interface

3.2.1 D-Sub Cable

Length : 1.8 M +/- 50 mm

Fix with monitor when packing, with transplant pin protective cover.

Connector type : D-Sub male with DDC2B pin assignments.
Blue connector thumb-operated jack screws

Pin assignments:

PIN No.	SIGNAL
1	Red
2	Green/ SOG
3	Blue
4	Sense (GND)
5	Cable Detect (GND)
6	Red GND
7	Green GND
8	Blue GND
9	DDC +3.3V or +5V
10	Logic GND
11	Sense (GND)
12	Bi-directional data
13	H/H+V sync
14	V-sync
15	Data clock

General Product Specification

3.2.2 DVI Cable

The input signals are applied to the display through DVI-D cable.

Length : 1.8 M +/- 50 mm

Connector type : DVI-D male with DDC-2B pin assignments

White connector thumb-operated jackscrews

With transplant pin protective cover.

Pin Assignment:

Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V)
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

3.3 Timing requirement

Factory Preset mode definition:

1. Perfect FOS while presenting those timings.
2. Will specify those timing in User's Manual

Preset mode definition:

1. Need to support those timings.
2. Perfect FOS after auto adjustment.

User mode

General Product Specification

1. Can save those timing that not in Preset mode and can be showed (not over scalar or Panel spec.)
2. It needs to reserve the 10 timings space in memory size.

3.3.1 Mode storing capacity

Factory preset modes : D-sub :18 , DVI : 17
 Preset modes : 50
 User modes : 10

3.3.2 Factory preset modes (D-sub18 modes)

- Factory modes and preset modes are defined in the enclosed timing table file



H9 Timing
 table_20080401.xls

- Video timing mode (internal firmware support) ,
 60Hz: 480p/720p/1080i/1080p
 50Hz: 576p/720p/1080i/1080p

General Product Specification

3.3.3 Software control functions via OSD / control adjustable functions:

Please refer to following Hudson9 OSD definitions, if any deviation, then refer to PVT Exit sample.

ITEM				
1	OSD DEFINITIONS	 Hudson 9 OSD Definition - v14.doc	Reset - No: Exit Yes: Auto adjustment for displaying timing mode and recall factory preset	
2	OSD LANGUAGES	 H8 OSD translation - 20070425 - Final.xls	 H9 new item translation _ 2008041	8 LANGUAGES
3	OSD TREE	 Button definition _ 20080428.xls		
4	POWER ON LOGO	 22W_1680x1050.zip	Power On Logo: Power On → Show up Philips logo 3 seconds → Change to input signal. This picture is reference only. The official drawing will send out by PM.	
5	Audio Selection	Stand-alone – On: Isolate video and audio control input Stand-alone – Off: Integrate video and audio control input Mute – On: Turn off audio Mute – Off: Turn on audio		

3.4 Horizontal scanning

Sync polarity : Positive or Negative
Scanning frequency : 30 – 83 K Hz

3.5 Vertical scanning

Sync polarity : Positive or Negative
Scanning frequency : 56 - 76 Hz

General Product Specification

3.6 Power input connection

Power cord length : 1.8 M
 Power cord type : 3 leads power cord with protective earth plug.

3.7 Power management

The monitor must comply with the Microsoft On Now specification, and meet EPA requirements.

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	< 36 W TBD W max.	Blue LED	--
Off	Off	Off	blanked	< 0.8 W	Blinking Blue LED Period: 3sec On, 3sec Off	< 3 s
DC Power Off			N/A	< 0.8 W	LED Off	

3.8 VGA Display identification

In accordance with VESA Display Channel Standard Ver.1.0 and DDC 2B capability

3.9 DVI Display identification

In accordance with DVI requirement (DDWG digital Visual Interface revision 1.0) use DDC-2B, DDC/CI, and EDID V1.3

3.10 USB support

Connect the upstream port of the monitor to host PC's USB port via USB cable,
 Then attach external device to the downstream port of the monitor.
 Check if the device can work properly.

3.11 DDC /CI Support and Smart Manage/Control

In accordance with VESA DDC/CI and MCCS ver.2.0, the monitor should be workable with
 Philips SmartManage, SmartControl V6.1, and
 Portrait Display Tune at least.

General Product Specification

3.12 Hot-key definition



Hot key operation for
Hudson Monitors.xls

3.13 Smart contrast (Dynamic contrast ratio)

Smart Contrast is a kind of dynamic backlight control.

This function changes

the panel backlight dynamically according to the frame brightness histogram.

At least the minimum contrast ratio has to be **3000:1**.

3.14 Smart image

3.14.2 Smart Image OSD outlook



3.14.2.1 Position

The position of the button is at the bottom center of the screen.

3.14.2.2 Smart Image Logo & Banner

As design to keep the LightFrame logo at header but change the name to "SmartImage" with bitmap format.

3.14.2.3 Icon of each profile

Each profile will use text instead of icon & text before.

General Product Specification

3.14.2.4 User Operation Procedure

- A. 5 different modes are switched to next in the sequence from 1 to 5 then back to 1 while pressing this button: 1) Office Work 2) Image Viewing 3) Entertainment 4) Economy 5) Off. The default setting is 'Off'.
- B. The FOS optimization will be changed in real time by which profile to be scrolled, users don't need to confirm to enable.
- C. The Smart Image OSD will remain on screen for 5 seconds after user last action. Or user can also press [MENU] to close the Smart Image OSD immediately.
- D. Except using [MENU] button to scroll down profile. If Smart Image OSD already launched onscreen. User is allowed to use up/down key to choose profile and press [MENU] to confirm selection and close the Smart Image OSD.
- E. If the model has multiple inputs including VGA and DVI, each input has their own set of profiles. When user switch input, the profile to be applied will also change.
- F. Each input can memorize their individual "Smart Image" profile status.
For example, Smart Image is on with "Office" profile at VGA input, when switch to DVI input, the Smart Image will revert to previous profile of DVI. In the input switching process the "Smart Image" OSD will also show up to present which profile is selected if "Smart Image" is enabled at that input.

The Smart Image status will also be stored after the monitor is resumed from AC on/off or power switch on/off.

3.14.2.5 Linkage between Smart Image OSD and main OSD

- A. Settings within main OSD have linkage with Smart Image OSD.
 - i. Brightness
 - ii. Contrast
 - iii. Color Temperature
- B. Because each preset profiles will define default setting of these 3 parameters. Users can understand what is the value of that in preset profile by open the

General Product Specification

main OSD.

C. When any SmartImage Lite profile had been enabled. The parameters in main OSD are still available for user to adjust. But these adjustments are temporary only. If users switch to another profile and then go back. The setting in main OSD will show preset values of that SmartImage profile enabled.

3.14.2.6 Profile Definitions (system integrators to input at design stages)

A. Office Work

- i. Purpose: Design for general office application, like word processing, Spreadsheet and email. The screen is dominated by text.
- ii. Enhancement point:
 1. A little sharpness for increasing the details of e.g. an excel grid.
No other type of enhancement as it won't bring value.
 2. Color temperature remains in 6500°K.
 3. Brightness level should be 70%.
 4. Smart Response set to "Off".
 5. Smart Contrast set to "Off".

B. Entertainment

- i. Purpose: Design for video application, Like Microsoft Media Player or Real Player. The screen is dominated by video.
- ii. Enhancement Point:
 1. Dynamic contrast enhancement by histogram analysis (DLC) should be implemented.
 2. Sharpness enhanced 90%.
 3. Color enhancement set as the same with Video.
 4. Color temperature set to 7500° (**Based on final PQ settings**) (if higher)
 5. Brightness level sets to maximum.
 6. SmartResponse set to "On".

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7. Gamma value set to 2.4
8. Fastest response time. (N/A for this model)
9. Smart Contrast set to "On"

C. Image Viewing

- i. Purpose: Design for image viewing application, especially in slide show. The screen is dominated by picture. Powerpoint presentation could use this profile also.
- ii. Enhancement Point:
 1. Dynamic contrast enhancement by histogram analysis (DLC) should be off.
 2. Sharpness and color to be enhanced 75%.
 3. Color temperature 6500°K
 4. Brightness level sets to maximum.
 5. Smart Response set to "Off".
 6. Smart Contrast set to "Off".

D. Economy

- i. Purpose: Adjust brightness level for reducing power consumptions
- ii. No optimization by Smart Image.
- iii. Design:
 1. Brightness level set to 70%, a little higher brightness level than laptop PC, fine tune brightness level before DVT exit.
 2. Color temperature set to 6500K.
 3. Gamma value set to 2.2 .

E. Off

- i. Purpose: No optimization by SmartImage.
- ii. Design:
 1. This will follow user OSD setting. If any change by user, it will be saved. When switch back from other SmartImage profiles, it will go back to last saved setting.

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2. Gamma Table is turn on to reduce bad color tracking.

3.14.2.7 Demo mode

A. Purpose: Built-in demo mode for sales in-store demo.

B. Design:

- i. Dynamically split screen to 2 vertical frames with one vertical white line. The line width is 2 pixels. The left frame will be enhanced by SmartImage Lite and right frame remains original performance.
- ii. There is OSD showing “SmartImage Lite & SmartResponse Demonstration” in left frame and “Original Image” in right frame.
- iii. The OSD word color is white with transparent background.
- iv. The demo profile will be “Video Playback” profile with “High” ODC setting.
- v. The current SmartContrast value also be shown on the bottom of the screen.

C. Hot keys to trigger:

Press [Smart Image] 3 seconds or more to trigger the demo mode.

When demo mode is On, press 3 seconds or more to turn off the demo mode.

When the demo mode is enabled, the blue LED will flash until demo mode disabled.

4 Visual characteristics

4.1 Test conditions

Unless otherwise specified, this specification is defined under the following conditions.

- (1) Input signal : As defined in 3.3, 1680 x 1050 non-interlaced mode (1680X1050@60Hz 146.25MHz), signal sources must have 75 ohm output impedance.
- (2) Luminance setting : controls to be set to 300 nits with full screen 100 % duty cycle white signal
- (3) Warm up: more than 30 minutes after power on with signal supplied.
- (4) Ambient light: 400 -- 600 lux.

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(5) Ambient temperature: 20 ± 5 °C

4.2 Brightness

Follow Panel specification.

4.3 Image size

Actual display size 473.76 mm x 296.1 mm

4.4 Brightness uniformity

Set contrast at 100% and turn the brightness to get average above 300 nits at centre of the screen.
Apply the Fig 1, it should comply with the following formula:

$$\frac{B_{\min}}{B_{\max}} \times 100\% > 75\%$$

Where $B_{\max}$ =Maximum brightness

$B_{\min}$ = Minimum brightness

4.5 Check Cross talk (S)

Apply Pattern 2. Set contrast and brightness at 100 %.
Measure YA. Then output Pattern 3 and measure YB.
the cross talk value :

$$\frac{ABS (YA - YB)}{YA} \times 100\% < 1.5 \%$$

4.6 White color adjustment

There are three factory preset white color 9300K, 6500K, sRGB.

Apply full gray64 pattern, with brightness in 100 % position and the contrast control at 50 % position.

The 1931 CIE Chromaticity (color triangle) diagram (x ,y) coordinate for the screen center should be:

Product specification

CIE coordinates	(x,y)	
-----------------	-------	--

General Product Specification

11500K	$x = 0.270 \pm 0.02$ $y = 0.281 \pm 0.02$	Perfect Tune II
9300K	$x = 0.283 \pm 0.02$ $y = 0.297 \pm 0.02$	Perfect Tune II
8200K	$x = 0.291 \pm 0.02$ $y = 0.306 \pm 0.02$	Perfect Tune II
7500K	$x = 0.298 \pm 0.02$ $y = 0.314 \pm 0.02$	Perfect Tune II
6500K/sRGB	$x = 0.313 \pm 0.02$ $y = 0.329 \pm 0.02$	Perfect Tune II
sRGB	$x = 0.313 \pm 0.02$ $y = 0.329 \pm 0.02$	Perfect Tune II
5000K	$x = 0.345 \pm 0.02$ $y = 0.357 \pm 0.02$	Perfect Tune II

Production alignment spec.

CIE coordinates	(x,y)	
11500K	$x = 0.270 \pm 0.005$ $y = 0.281 \pm 0.005$	Perfect Tune II
9300K	$x = 0.283 \pm 0.005$ $y = 0.297 \pm 0.005$	Perfect Tune II
8200K	$x = 0.291 \pm 0.005$ $y = 0.306 \pm 0.005$	Perfect Tune II
7500K	$x = 0.298 \pm 0.005$ $y = 0.314 \pm 0.005$	Perfect Tune II
6500K/sRGB	$x = 0.313 \pm 0.005$ $y = 0.329 \pm 0.005$	Perfect Tune II
sRGB	$x = 0.313 \pm 0.005$ $y = 0.329 \pm 0.005$	Perfect Tune II
5000K	$x = 0.345 \pm 0.005$ $y = 0.357 \pm 0.005$	Perfect Tune II

Quality Inspection specification:

CIE coordinates	(x,y)	
9300K	$x = 0.283 \pm 0.015$ $y = 0.297 \pm 0.015$	
6500K/sRGB	$x = 0.313 \pm 0.015$ $y = 0.329 \pm 0.015$	
sRGB	$x = 0.313 \pm 0.015$ $y = 0.329 \pm 0.015$	

General Product Specification

5 Mechanical characteristics

5.1 Cosmetic -

Philips ID

5.2 Mechanical data files -

ProE files required

5.3 Location of Philips logo -

Per Philips make-up sheet

5.4 Gap between panel and front bezel

< 1.2mm

5.5 Location of Control icons -

Per Philips Graphic sheet

5.6 Color for resin/paint -

Per Philips make-up sheet

5.7 Resins

- RoHS required
- WEEE required.
- Resin type/selection refer to Project Book Section 7.2 Plastic material.

5.8 If paint is used

- RoHS required
- WEEE require
- If new painting type need to implement, refer to UN-D 1235.

5.9 Plastic mold tooling

- Tooling to be designed to minimize cosmetic defects induced by molding process (sink, blush, weld lines, gate marks, ejector marks, etc.). Refer to “TYV61-90007”.

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- Painting to cover up cosmetic defects due to molding is strongly discouraged.
- China RoHS mark requested.

5.10 Plastics flammability

- All Plastics to be Flame Retardant UL 94-V0 or Better (if monitor weighs less than 18kg; UL94-V0 is OK).
- Base / Pedestal to be Flame Retardant UL 94-HB.
- All major plastic parts (bezel, back cover) need to be molded from same resin.
- ABS V0 is allowed to implement in China region for monitor body major plastic parts (bezel, back cover).
- Plastic resin type selection should be referred to “TY R83-2-9002-1”.

5.11 Texture/Glossing of housing

- The texture area and texture no should follow Philips make-up sheet.
- The exterior surfaces shall have a uniform texture.
- Philips must approve the mold texturing.
- Detail document for texture refer to “UN-D249”, “UN-D 600”.
- ≤ 20 gloss units

5.12 Tilt and swivel base

- Tilt angle : $-5^{\circ} +2/- 0^{\circ}$ (forward)
 $+20^{\circ} + 0/- 3^{\circ}$ (backward)
- Swivel angle : _____ nil
- High Adjustment : _____ nil
- Portrait Display : _____ nil

5.13 Kensington Lock

- Must meet Kensington_slot.spec “TYE-M0004”.
- MMD request metal plate in Kensington hole.

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5.14 Label

- Regulatory label / Carton label should follow Philips requirement.
- China RoHS label
- Detail document refer to Philips Engineering Reference Book.

5.15 Product dimension / Weight ([Refer to Philips approved SHT 191](#))

- Unit dimension : 513.8mm (W) * 416.2mm(H) * 213.6mm(D)
- Packed unit dimension: 565mm(W) * 174mm(H) * 472 mm(D) for WW
: 567mm(W) * 189mm(H) * 480 mm(D) for China
- Net weight : 5.Kg (Including I/F cable 240 g)
- Gross weight : Kg for WW
: Kg for China

5.16 Transportation

Transportation standards refer to TYE-M0002.

5.16.1 Transportation packages

Packaging and wrapping shall be sufficient to protect the product against damage or loss during shipment from the supplier to the destination specified in the purchase order. All packaging materials are subject to test and evaluation per TYE-M0002.

The cushion material shall be constructed using EPS material.

The doggy hole is requested.

5.16.2 Transportation Test

The overall test refer to TYE-M0002.

Vibration, drop test should be performed at ambient temperature(20°C to 23°C) and relative humidity (40% to 65%).

A. Transportation test specification for all regions except China/India

- Package test
 1. Random Vibration test

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- 2. Drop test
- 3. Cold Drop test (for design reference)
- Un-package test
 - 1. Half sine shock test (non operation)

B. Transportation test specification for China/India

- Package test
 - 1. Random Vibration test
 - 2. Drop test
 - 3. Cold Drop test (for design reference)
- Un-package test
 - 1. Sine vibration (operating)
 - 2. Half sine shock test (non operation)

5.17 Pallet / Container loading ([Refer to Philips approved SHT 560](#))

Transportation standards refer to TYE-M0002 and UAW-0309.

- Air shipment -
- Sea container 20'(pallet/slip sheet)
- Sea container 40'(pallet/slip sheet)
- Sea container 40' High Cube (pallet/slip sheet)
- Land 53' MEGA Trailer (pallet/slip sheet)
- Land 53' MEGA Trailer per HQ (pallet/slip sheet)
- Truck shipment-

Transportation request for all region except China/India

- A. Air shipment
- B. Container loading for WW
- C. Land 53' MEGA Trailer

Transportation request for China and India

- A. Container loading for China and India
- B. Truck loading

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6 Environmental characteristics

The following sections define the interference and susceptibility condition limits that might occur between external environment and the display device.

6.1 Susceptibility of display to external environment

Operating

- Temperature : 0 to 35 degree C
- Humidity : 80% max
- Altitude : 0-3658m
- Air pressure : 600-1100 mBAR

Storage

- Temperature : -20 to 60 degree C
- Humidity : 95% max
- Altitude : 0-12192m
- Air pressure : 300-1100 mBAR

Note: recommend at 5 to 35°C, Humidity less than 60 %

6.2 Transportation tests

Refer to 5.15.2

6.3 Display disturbances from external environment

According to IEC 801-2 for ESD disturbances

6.4 Display disturbances to external environment

7 Reliability

7.1 Mean Time Between Failures

System MTBF (Including the LCD panel and CCFL) : 50,000 hrs

8 Quality assurance requirements

8.1 Acceptance test

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According to MIL-STD-1916D Control III level

AQL: NA

(Please also refer to annual quality agreement)

Customer acceptance criteria: UAW0377/00

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9 Philips' Flat Panel Monitors Pixel Defect Policy

Philips' Flat Panel Monitors Pixel Defect Policy

BRIGHT DOT DEFECTS	ACCEPTABLE LEVEL		
MODEL	220CW9		
1 lit sub-pixel	3		
2 adjacent lit sub-pixels	1		
3 adjacent lit sub-pixels (one white pixel)	0		
Distance between two bright dots	15mm		
Bright dot defects within 20 mm circle	0		
Total bright dot defects of all type	3		

BLACK DOT DEFECTS	ACCEPTABLE LEVEL		
MODEL	220CW9		
1 dark sub-pixel	5		
2 adjacent dark sub-pixels	2		
3 adjacent dark sub-pixels (one white pixel)	1		
Distance between two black dots	15mm		
Black dot defects within 20 mm circle*	1		
Total black dot defects of all type	5		

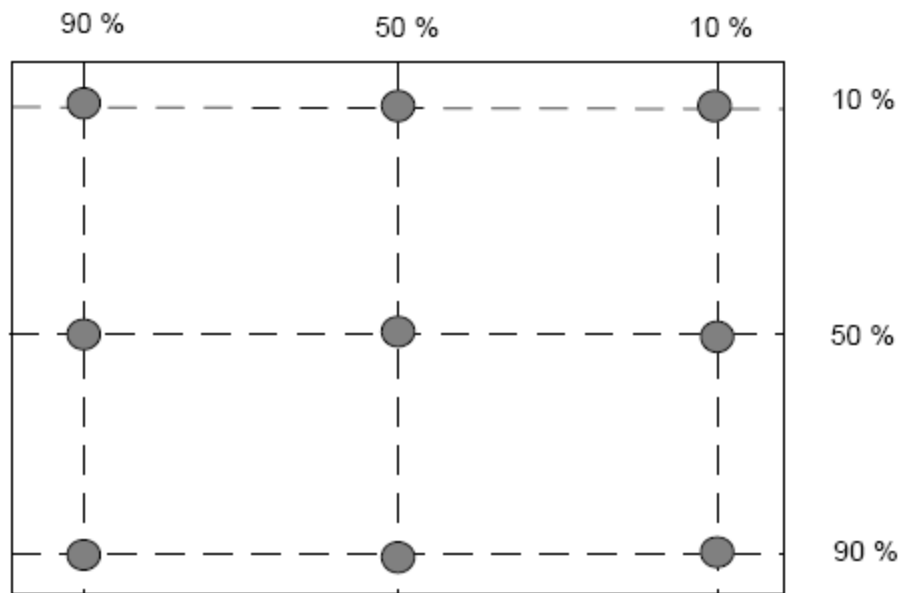
TOTAL DOT DEFECTS	ACCEPTABLE LEVEL		
MODEL	220CW9		

General Product Specification

Total bright or black dot defects of all type	5		
--	---	--	--

General Product Specification

Fig 1: Measurement locations of Brightness Uniformity



General Product Specification

Fig 2: Cross talk pattern
Gray level 46 (64 Gray level)

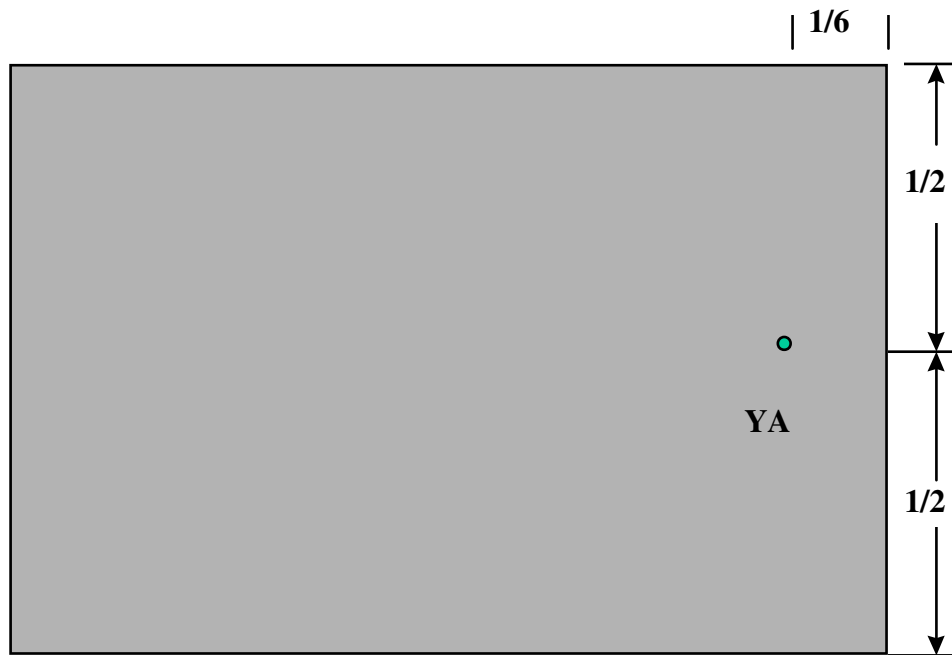
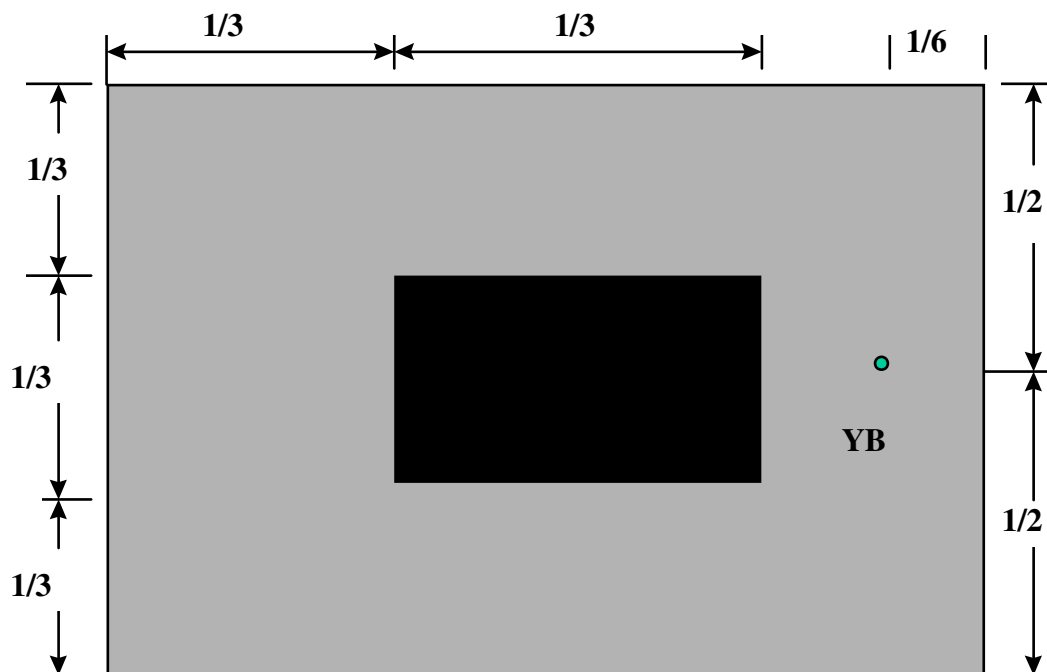
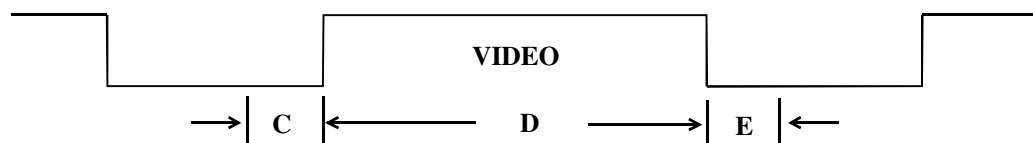


Fig 3: Cross talk Pattern
Center at Gray level 0 (Black)



General Product Specification

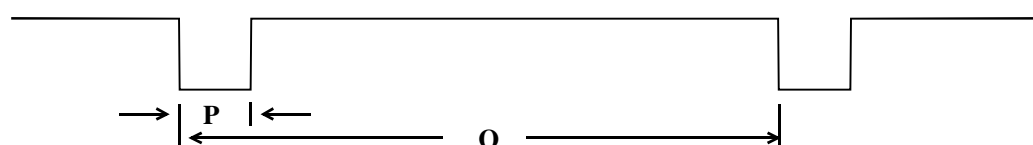
SEPARATE SYNC.



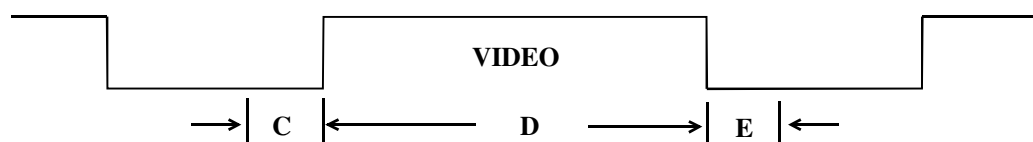
HORIZONTAL



VERTICAL



COMPOSITE SYNC.



HORIZONTAL

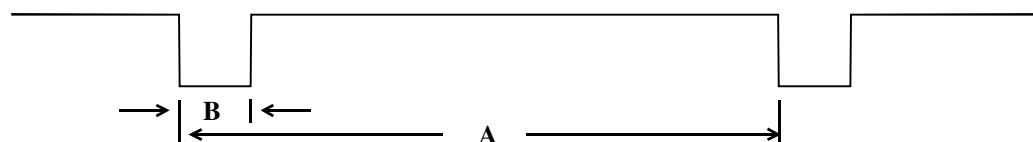


FIG-4 TIMING CHART -1

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10 REGULATORY COMPLIANCE

10.1 Worldwide Regulatory



WW_Regulatory.xls

10.2 EMC Requirements

Supplier DVT EMI test result must be submitted prior to DVT samples delivery, and PVT EMI test result must be submitted again prior to PVT samples delivery. Which also has to meet Philips' immunity testing specification.

10.3 RoHS

Restriction on the use of certain hazardous substances.

Lead, Cadmium, Mercury, Hexavalent Chromium, Polybrominated Biphenyl (PBB) and Polybrominated Biphenyl Ether (PBDE)(flame retardant).

10.4 WEEE

Producer (Philips) responsible for retailer take back schemes and recycling.

--System implemented.

--Collection and recycle targets.

10.5 Ongoing Regulatory

There's a possibility that other regulatory certificates will be required during the life of the product.

It is the responsibility of the supplier to provide related documentation.

Spare / Recommended Parts List

Model:220CW9

Panel+PCBA Styling		Model	LPL 220C W9F-B I69	SEC 220C W9F-B I69	LPL 220C W9F-B I00	SEC 220C W9F-B I00	LPL 220C W9F-B I73	SEC 220C W9F-B I73	LPL 220C W9F-B I83	SEC 220C W9F-B I83
location	Description	PCM code	Philips 12NC							
4	MAIN (I/F) BOARD ASS'Y	5E.0KF01.011	996510018553	V						
		5E.0KF01.001		V	V	V	V	V	V	V
5	POWER BOARD ASS'Y	5E.0KF02.001	996510018555	V	V	V	V	V	V	V
13	ASSY CTRL BD+FFC CABLE	6K.0KF07.001	996510018562	V	V	V	V	V	V	V
2	ASSY LED BD+FFC CABLE	6K.0KF08.001	996510018563	V	V	V	V	V	V	V
9	USB BD	5E.0KJ08.001	996510018324	V	V	V	V	V	V	V
10	USB BD	5E.0KJ32.001	996510018325	V	V	V	V	V	V	V
3	LCDM LM220WE1-TLE2/TLE4 (LPL)	5F.LLB P9.001	996510017933	V		V		V		V
	LCDM LTM220M1-L01 SD(SEC)	5F.LS BVP.011		V	V	V		V		V
27	FFC CABLE 30P	5K.0KF02.001	996510018557	V	V	V	V	V	V	V

Mechanical Styling		Model		220CW9F-B769		220CW9F-B700		220CW9F-B775		220CW9F-B793	
location	Description	PCM code	Philips 12NC	LPL	SEC	LPL	SEC	LPL	SEC	LPL	SEC
18	BASE ASS'Y	6K..0KF06..001 6E..0KF03..001	996510018556	V	V			V	V	V	V
15	STAND ASS'Y	6K..0KF09..001 6E..0KF01..001	996510018561	V	V			V	V	V	V
1	FRONT BEZEL ASS'Y (Black)	6K..0KF01..001 6K..0KF01..021	996510018558	V	V	V	V	V	V		V
11	REAR COVER ASS'Y	6K..0KF02..001	996510018560	V	V	V	V	V	V	V	V

Packing Styling		Model		220CW9F-B/69		220CW9F-B/80		220CW9F-B/75		220CW9F-B/93	
				LPL	SEC	LPL	SEC	LPL	SEC	LPL	SEC
location	Description	PCM code	Philips 12NC								
100	CUSHION B EPS	4G.0KF03.001	996510018565	V	V	V	V	V	V		
		4G.0KF01.001								V	V
110	CUSHION T EPS	4G.0KF04.001	996510018566	V	V	V	V	V	V		
		4G.0KF02.001								V	V
120	CARTON	4D.0KF02.001	996510018564	V	V	V	V				
		4D.0KF02.002						V	V		
		4D.0KF01.001								V	V

Accessory Styling		Model		220CW9F-B 69		220CW9F-B 00		220CW9F-B 75		220CW9F-B 93	
location	Description	PCM code	Philips 12NC	LPL	SEC	LPL	SEC	LPL	SEC	LPL	SEC
200	USER MANUAL 220CW9	4J.0KF01.001	996510018567	V	V	V	V	V	V	V	V
210	CD 220CW9	5B.0KF01.001	996510018568	V	V	V	V	V	V	V	V
30	CORD H05VV-F 13A 1.8MM UK	2G.03149.021	996510007304	V	V						
	CORD H05VV-F 10A250V EUR 1.8M	2G.00921.001				V	V				
	CORD 3ASL/75DU-IN 250V1.8M AUS	2G.01343.001						V	V		
	CORD RVV 250V 1.8M BLK CHINA	2G.04245.001								V	V
28	CABLE SIGNAL (D-SUB)	5K.L2H06.511	996510007978	V	V	V	V	V	V	V	V
29	DVI CABLE	5K.L0S05.501	996510007963	V	V	V	V				
		5K.05407.501						V	V	V	V

[illegible]

Panel & PCBA photos

ITEM	PCM	Philips 12NC	Description	Photo
1	5F.LLB P9.001	996510017933	LCDM LM220WE1-TLE2/TLE4 (LPL)	
2	5F.LSBVP.001		LCDM LTM220M1-L01(SEC)	
3	5E.0KF01.011	996510018553	MAIN (I/F) BOARD ASS'Y	
4	5E.0KF01.001		MAIN (I/F) BOARD ASS'Y	
5	5E.0KF02.001	996510018555	POWER BOARD ASS'Y	
6	6K.0KF07.001	996510018562	ASSY CTRL BD+FFC CABLE	
7	6K.0KF08.001	996510018563	ASSY LED BD+FFC CABLE	
8	5E.0KJ08.001	996510018324	USB BD	
9	5E.0KJ32.001	996510018325	USB BD	

0. Warning

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the unit via a wrist wrap with resistance. Keep components and tools also at the same potential!

1. Servicing of SMDs (Surface Mounted Devices)

1.1 General cautions on handling and storage

- Oxidation on the terminals of SMDs results in poor soldering.

Do not handle SMDs with bare hands.

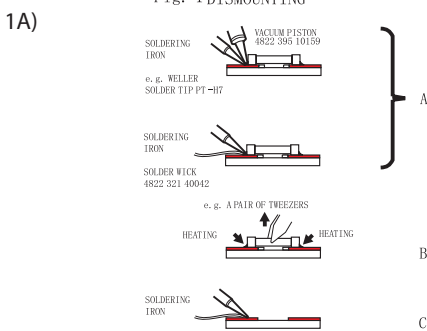
- Avoid using storage places that are sensitive to oxidation such as places with sulphur or chlorine gas, direct sunlight, high temperatures or a high degree of humidity. The capacitance or resistance value of the SMDs may be affected by this.

- Rough handling of circuit boards containing SMDs may cause damage to the components as well as the circuit boards. Circuit boards containing SMDs should never be bent or flexed. Different circuit board materials expand and contract at different rates when heated or cooled and the components and/or solder connections may be damaged due to the stress. Never rub or scrape chip components as this may cause the value of the component to change. Similarly, do not slide the circuit board across any surface.

1.2 Removal of SMDs

- Heat the solder (for 2-3 seconds) at each terminal of the chip. By means of litz wire and a slight horizontal force, small components can be removed with the soldering iron. They can also be removed with a solder sucker (see Fig. 1A)

Fig. 1 DISMOUNTING



While holding the SMD with a pair of tweezers, take it off gently using the soldering iron's heat applied to each terminal (see Fig. 1 B).

- Remove the excess solder on the solder lands by means of litz wire or a solder sucker (see Fig. 1 C).

1.3 Caution on removal

- When handling the soldering iron, use suitable pressure and be careful.
- When removing the chip, do not use undue force with the pair of tweezers.
- The soldering iron to be used (approx. 30 W) should

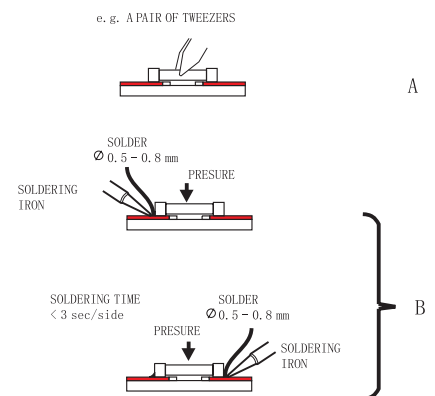
preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).

- The chip, once removed, must never be reused.

1.4 Attachment of SMDs

- Locate the SMD on the solder lands by means of tweezers and solder the component on one side. Ensure that the component is positioned correctly on the solder lands (see Fig. 2A).
- Next complete the soldering of the terminals of the component (see Fig. 2B).

Fig. 2 MOUNTING

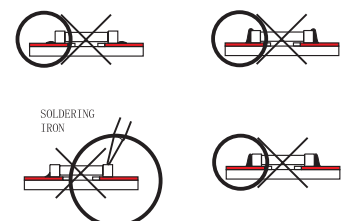


2. Caution when attaching SMDs

- When soldering the SMD terminals, do not touch them directly with the soldering iron. The soldering should be done as quickly as possible, care must be taken to avoid damage to the terminals of the SMDs themselves.
- Keep the SMD's body in contact with the printed board when soldering.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).
- Soldering should not be done outside the solder land.
- Soldering flux (of rosin) may be used, but should not be acidic.
- After soldering, let the SMD cool down gradually at room temperature.
- The quantity of solder must be proportional to the size of the solder land. If the quantity is too great, the SMD might crack or the solder lands might be torn loose from the printed board (see Fig. 3).



Fig. 3 Examples



3. Lead-free product identification

You can identify lead-free product by Philips-lead-free logo on PCB.



4. Lead-free product repair instruction

4.1 Use only lead-free Solder Alloy 0622 149 00106(1.2mm SAC305) or 0622 14900108(1.0mm SAC305).

Remark: For lead free soldering material, please visit www.alphametals.com website for details. This is recommended by Philips.

4.2 Use only adequate solder tools applicable for lead-free soldering-tin. The solder tool must be able to reach at least a solder-temperature of 400 , to stabilize the adjusted temperature at the solder-tip and to exchange solder-tips for different applications. Small Passives/Actives to be removed with thermal tweezers

Automated system for IC and BGA repair (Microscope, Camera, Beam split optics, Computer, Programmer, Heat controllers, Vacuum system, Laser pointer) Solder Hand-Tool (Adjustable in temperature height, Temperature shall be held constant, Flexible tips)

4.3 Adjust your solder tool so that a temperature around 360 -380 is reached and stabilized at the solder joint.

Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400 otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. Corrosion of Tool-Spikes can be avoided when using SAC305 and a temperature of less than 400 .

4.4 Mix of lead-free solder-tin/parts with leaded soldering-tin/parts is possible but not recommended. If not to avoid clean carefully the solder-joint from old tin and re-solder with new tin.

4.5 Use only original spare-parts listed in the Service-Manuals. Standard-material(consumables) can also be purchased at external companies.

4.6 Special information for lead-free BGA-ICs: this ICs will be delivered in so-called dry-packaging to protect the IC against moisture and with lead-free logo on it. This packaging may only be opened shortly before it is used (soldered). Otherwise the body of the IC gets wet inside and during the heating time the structure of the IC will be destroyed due to high (steam-)pressure. If the packaging was opened before usage the IC has to be heated up for some hours (around 90) for drying (Take attention for ESD-protection!)

5. Rework on BGA (Ball Grid Array) ICs

General

Although (LF)BGA assembly yields are very high, there may still be a requirement for component rework. By rework, we mean the process of removing the component from the PWB and replacing it with a new component. If an (LF)BGA is removed from a PWB, the solder balls of the component are deformed drastically so the removed (LF)BGA has to be discarded.

Device Removal

As is the case with any component that, it is essential when removing an (LF)BGA, the board, tracks, solder lands, or surrounding components are not damaged. To remove an (LF)BGA, the board must be uniformly heated to a temperature close to the reflow soldering temperature. A uniform temperature reduces the chance of warping the PWB.

To do this, we recommend that the board is heated until it is certain that all the joints are molten. Then carefully pull the component off the board with a vacuum nozzle. For the appropriate temperature profiles, see the IC data sheet.

Area Preparation

When the component has been removed, the vacant IC area must be cleaned before replacing the (LF)BGA.

Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent. After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF)BGA

Note: Do not apply solder paste, as this has shown to result in problems during re-soldering.

Device Replacement

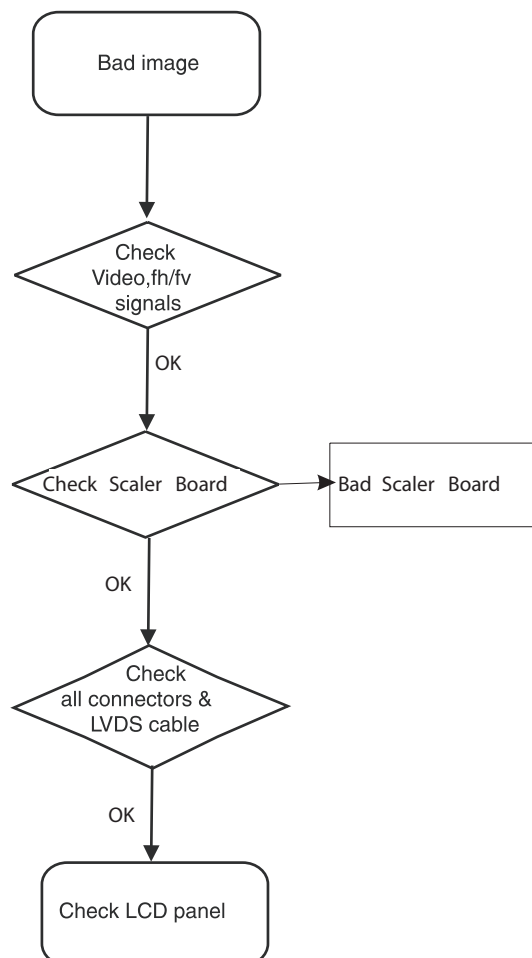
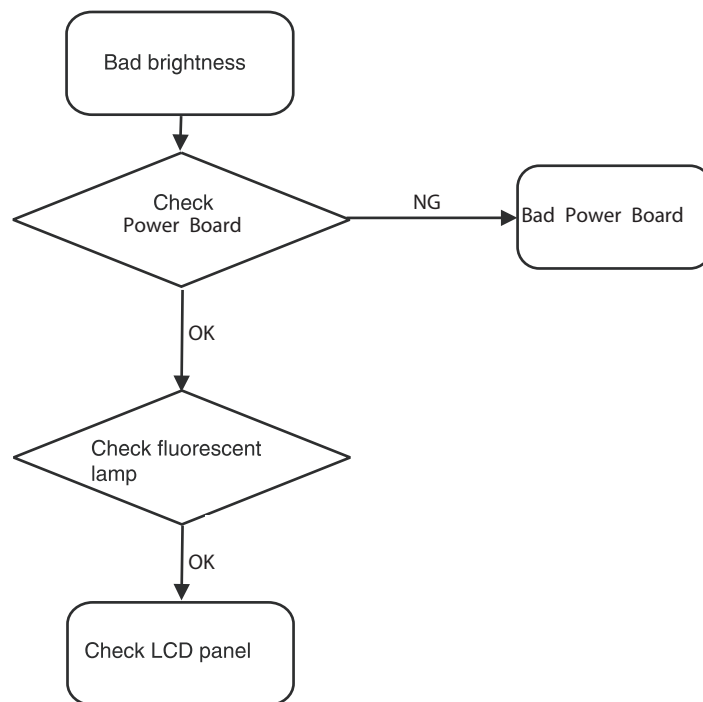
The last step in the repair process is to solder the new component on the board. Ideally, the (LF)BGA should be aligned under a microscope or magnifying glass. If this is not possible, try to align the (LF)BGA with any board markers.

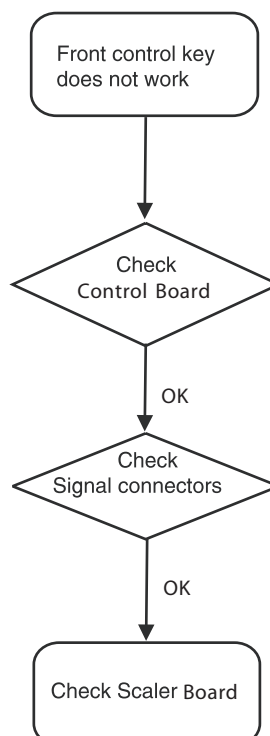
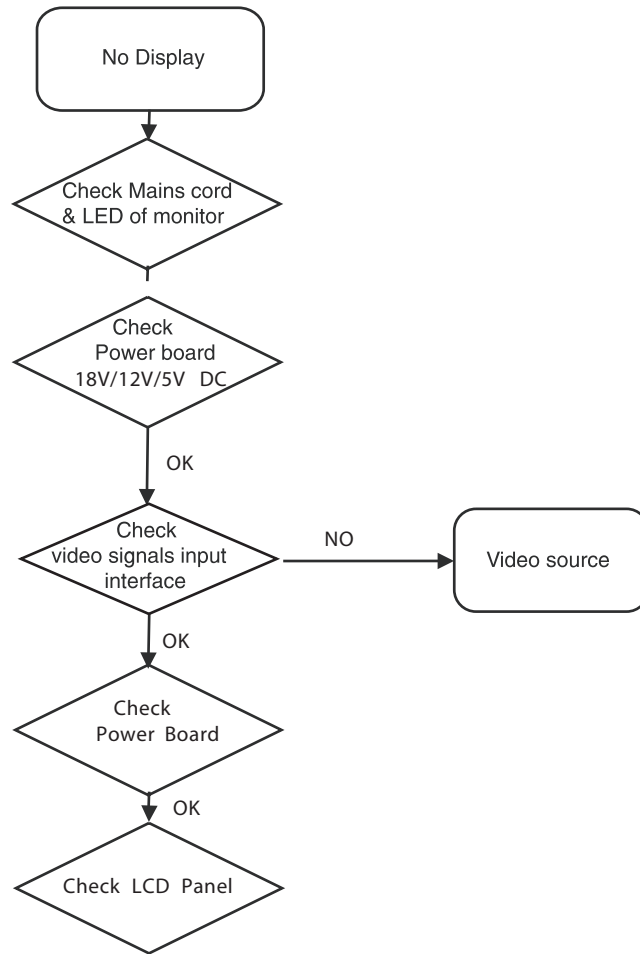
To reflow the solder, apply a temperature profile according to the IC data sheet. So as not to damage neighbouring components, it may be necessary to reduce some temperatures and times.

More Information

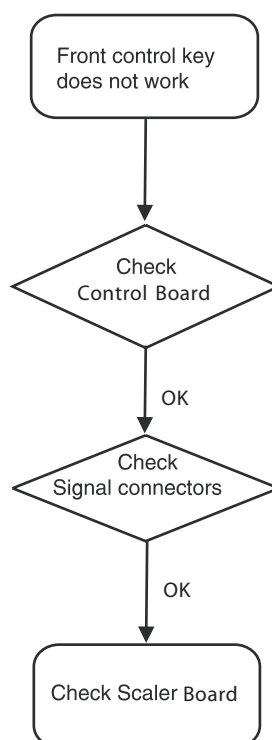
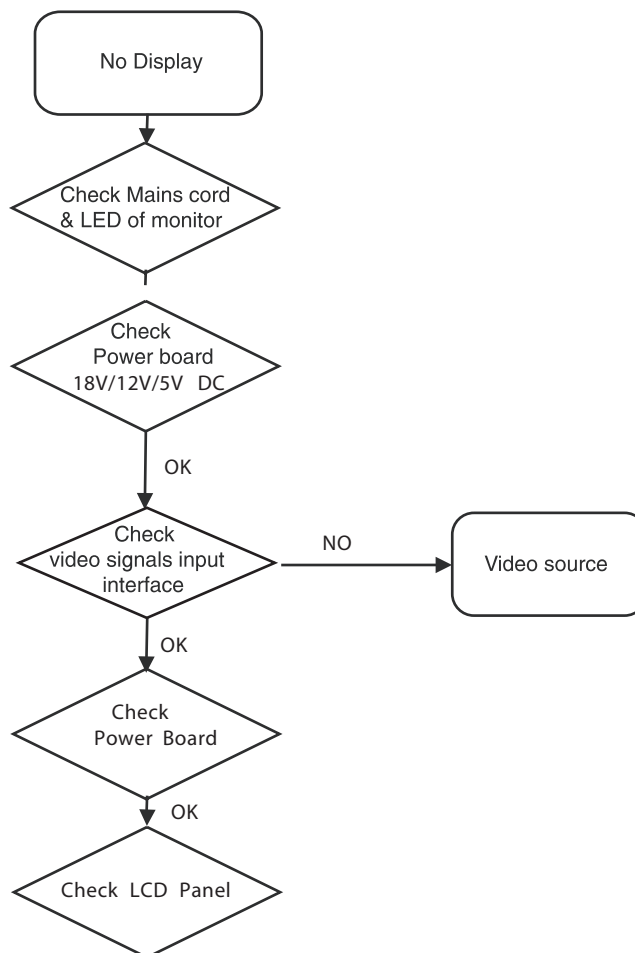
For more information on how to handle BGA devices, visit this URL: <http://www.atyourservice.ce.philips.com> (needs subscription). After login, select Magazine, then go to Workshop Information. Here you will find information on how to deal with BGA-ICs.

Repair Flow Chart





Repair Flow Chart



Safety Test Requirements

All units that are returned for service or repair must pass the original manufactures safety tests. Safety testing requires both Hipot and Ground Continuity testing.

HI-POT TEST INSTRUCTION

1.Application requirements

- 1.1 All mains operated products must pass the Hi-Pot test as described in this instruction.
- 1.2 This test must be performed again after the covers have been refitted following the repair , inspection or modification of the product.

2. Test method

2.1 Connecting conditions

- 2.1.1 The test specified must be applied between the parallel-blade plug of the mainscord and all accessible metal parts of the product.
- 2.1.2 Before carrying out the test, reliable conductive connections must be ensured and thereafter be maintained throughout the test period.
- 2.1.3 The mains switch(es) must be in the "ON" position.

2.2 Test Requirements

All products should be HiPot and Ground Continuity tested as follows:

Condition	Hi-Pot Test for products where the mains input is 220V AC	Hi-Pot Test for products where the mains input is 110V AC	Ground Continuity Test requirement
Test voltage	2820VDC (2000VAC)	1700VDC (1200VAC)	Test current: 25A, AC
Test time	3 seconds	1 seconds	Test time: 3 seconds
Trip current (Tester)	Set at 100uA for Max limit; Set at 0.1uA for Min limit.	5mA	Resistance required: $\leq 0.09 + R_{ohm}$, R is the resistance of the mains cord.
Ramp time (Tester)	Set at 2 seconds		

- 2.2.1 The minimum test duration for Quality Control Inspector must be 1 minute.
- 2.2.2 The test voltage must be maintained within the specified voltage + 5%.
- 2.2.3 There must be no breakdown during the test.
- 2.2.4 The grounding blade or pin of mains plug must be conducted with accessible metal parts.

3. Equipments and Connection

3.1. Equipments

For example :

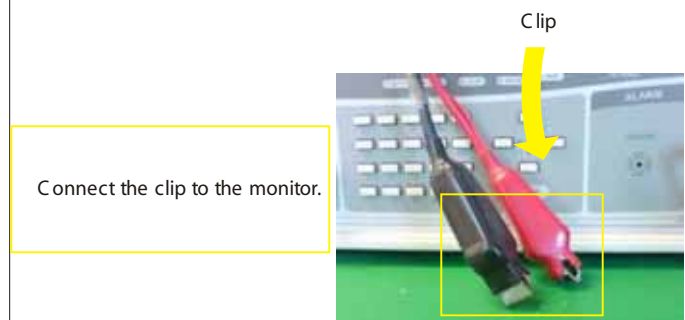
- Zentech 9032 PROGRAMMABLE AUTO SAFETY TESTER

3.2. Connection

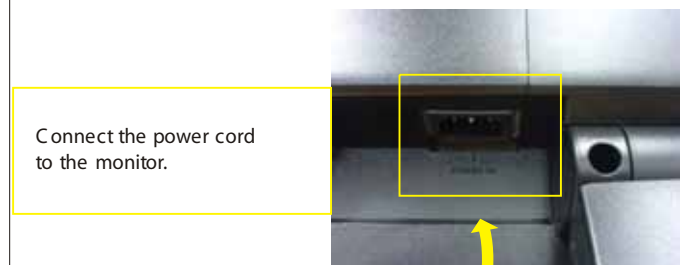
- * Turn on the power switch of monitor before Hipot and G round C ontinuity testing.



(Zentech 9032 tester)



Connect the clip to the monitor.



Connect the power cord to the monitor.

Power outlet

4. Recording

(Rear view of monitor)

Hipot and Ground Continuity testing records have to be kept for a period of 10 years.